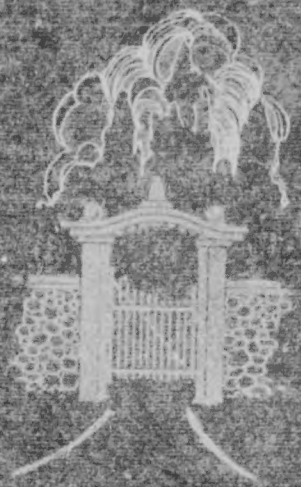
OTTAWA

The City of Gardens



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HORTICULTURAL SOCIETY

Compliments of
R B Whyte

OTTAWA HORTICULTURAL SOCIETY

OTTAWA, A CITY OF GARDENS.

A Guide for the Improvement of the Lawns and Gardens in Ottawa, prepared by the following Committee:

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Published for the Ottawa Horticultural Society
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To the Citizens of Ottawa

Ottawa, "The City of Gardens," that is what the Capital should and would be, if individual householders would realize and embrace their opportunities.

An observing visitor coming to Ottawa will be impressed with the beauty of its setting and the richness of charm within its borders. With the single exception of Quebec, Ottawa is undoubtedly the most beautifully situated city in Canada. The mountains, the rivers, the waterfalls and other scenery of varied character as seen from Parliament Hill, Nepean Point, Rockcliffe, and many other outlooks, charm the lover of nature as do few spots on this continent. To the natural beauty has been added much charm through various public agencies and private endeavour. No other city in Canada enjoys the favour of a government supported Improvement Commission. Only the Capital can enjoy this advantage. Then there is, at the very door of the city, the Central Experimental Farm with its wealth of horticultural interest and lessons to be learned for the asking, that perhaps too few appreciate, and what is still of more immediate interest to the people of the city, is the Ottawa Horticultural Society, the value of which so many of the citizens have learned to appreciate.

THE IMPROVEMENT COMMISSION.

Since its inception in 1899, the Ottawa Improvement Commission has expended more than one and one-half millions of dollars. The work has been accomplished under the supervision of experts in laying out, beautifying, and maintaining many parks, comprising about two hundred and fifty acres of land, and in building and beautifying driveways of about fourteen miles in length. This work embodies the reclaiming of unsightly tracts, the construction of roads and bridges, the grading, sodding, and planting of its grounds with the most extensive variety of native and foreign trees and shrubs and the laying out and maintaining of flower beds of exquisite beauty. This has all been done for the purpose of making Ottawa a more beautiful place in which to live. The opinion has been expressed that many citizens, by reason of the activities of the Improvement Commission, have felt themselves relieved of any responsibility for the working out of a plan to beautify the city. In a general way this may be true, but to the extent that it is so do residents deprive themselves of the genuine enjoyment of participation in a most worthy enterprise.

There are many beautiful home grounds in Ottawa. Here, as elsewhere, there are lovers of horticulture whose influence is a valuable asset to any urban district. These citizens spend means and effort to beautify their grounds. They do this with the same interest and intelligence as they conduct their respective avocations. It is their recreation and all who live near them or pass by their homes share the joys of the fruits of their skill.

THE OTTAWA HORTICULTURAL SOCIETY.

The enthusiastic horticulturist is a public-spirited citizen, and to a number of these credit must be given for the inception and influence of the Ottawa Horticultural Society. This organization began on January 17th, 1893, when a small number of amateur horticulturists were united for mutual benefit. During that year the organization was incorporated under the Agricultural and Arts Act of Ontario and thus obtained the right to participate in the annual government grant to the horticultural societies in the province.

The first officers of the Society were, President, Lt.-Col. Wm. White; first vice-president, John Craig; second vice-president, Robert Surtees; Secretary-treasurer, P. G. Keyes. Board of Directors—R. B. Whyte, C. Scrim, J. Sorley, John Graham, Alexander Robb, D. Matheson, Robert Currie and Thomas Nicholson. Some of these men, it will be recognized, have maintained a keen interest in the Society and its work up to the present time.

The object of the Society is to interest the citizen in horticulture and to assist him in beautifying his immediate surroundings. This is accompanied by the distribution of plants, bulbs, and seeds, and by carrying on exhibitions, competitions and educational meetings. It would be difficult to over-estimate the influence of the annual distribution on the beautifying of the city. Taking one year for example—1908—there were distributed 22,000 bulbs, 12,000 plants and 800 shrubs and climbers and a large quantity of seeds. Nor were these imposed arbitrarily on the members, who were granted the privilege of selecting from a large number of well-chosen options such premiums as the members in their judgment considered most suitable for their needs and surroundings. This annual distribution continues and improves with the experience of years. Nor are members, more particularly new ones, required to become expert growers before being able to make the best use of these premiums. At its monthly meetings and flower shows, provision is made for instructing beginners in the planting and growing of decorative plants and securing such other horticultural information as they may require. In the annual distribution and competitions the Society has, during its twenty-four years, expended upwards of twenty-five thousand dollars.

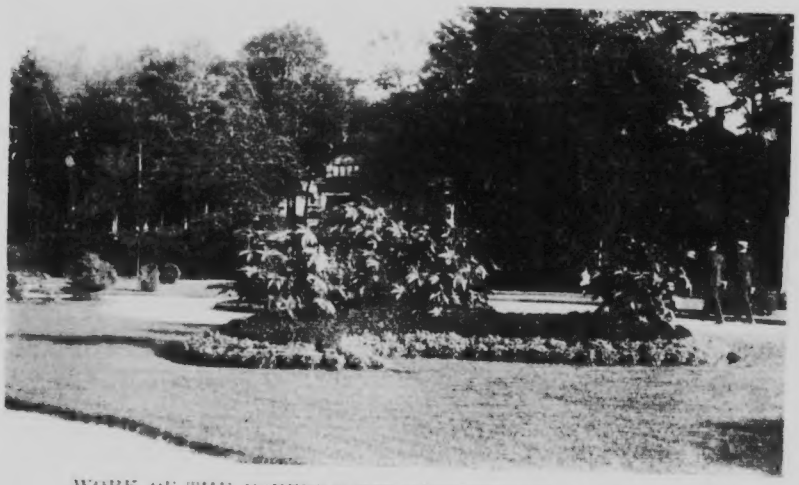
Wherever one finds a beautiful garden in Ottawa he will assuredly have discovered a reflection of the Horticultural Society. Whether the proprietor be a veteran or a more recently enrolled member of the Society, his planting will represent its influence. Gardening is undoubtedly "contagious." A well-planted and neatly kept front lawn or back yard affords an incentive to emulation, until in some cases the residents of whole blocks are brought under the spell of gardening. The very nature of many beautiful herbaceous plants to spread, would seem to extend to their growers. One finds local perennial borders spreading from garden to garden throughout a neighborhood, shedding beauty, exciting enthusiasm, and stimulating joy, health and generosity of which the non-gardener knows nothing. And so the horticulturist, unconsciously perhaps, becomes a powerful factor in beautifying the district in which he lives and thereby adding to the charm of the city.

WORK OF THE GOVERNMENT IMPROVEMENT COMMISSION.

The visitor who pursues his study of the city, after investigating the driveways, parks and public gardens, cannot fail to observe very many neglected opportunities as he motors up and down many of the streets. The ugly vacant lots overrun with weeds and harbouring debris, the bare lawns and neglected backyards that his eye cannot fail to detect, will go far to mar the picture that his brain conceived from his first impressions. Here, perhaps, is the weak link in the chain of city beautification. The city is a conglomerate thing made up of numerous individualities. Whatever the Improvement Commission, the civic authorities and the Horticultural Society may do to adorn the city,

it will never give a completely good impression unless the individual citizens unite in a common endeavour to make the surroundings of their homes attractive. If every house front and every home garden in Ottawa were well kept we should have an entirely beautiful city. To encourage and assist such a movement the Ottawa Horticultural Society offers its services. Membership in the Society brings more value in actual planting material than the fee charged. It extends the helping hand of hundreds of co-workers engaged in a like pursuit. It is to enlist the active interest of the householders of Ottawa in this great cause and to inform them in what direction their efforts had best be directed, this little book is published.

The City of Ottawa, with its driveways, system of parks, beautiful homes and opportunities for horticulture, might be made quite the most beautiful city in America. Toronto, "The Queen City," Hamilton, "The Ambitious City," London, "The Forest City," are all proud of their designations and what could be a more worthy designation for Ottawa than "The City of Gardens."



WORK OF THE GOVERNMENT IMPROVEMENT COMMISSION.

THE MAKING AND CARE OF LAWNS.

The lawn is our outdoor carpet, and a very beautiful carpet it is, and upon it in suitable positions are to be placed the garden furnishings, in the shape of shrubs, trees, etc., which are to remain as fixed furniture for many years.

A lawn, then, if for this reason alone, should be well made, but another equally important reason for starting the lawn correctly, is that a good velvety lawn is more delightful to walk

NEW PERENNIAL BORDER AT CENTRAL EXPERIMENTAL FARM, OTTAWA.

upon than anything else, whereas, a poor-looking lawn is an eyesore and a source of constant trouble.

Lawn grasses are so classed because of a peculiar habit of growth which separates them from among hundreds of other-varieties. Often, however, these other varieties get into lawns and cause trouble by producing patchy effects, due to a difference in the habit of their growth. Burnt-looking patches, in dry spells, are often due to their presence, although such patches may be the result of an uneven type of soil or uneven water supply. This being the case suggests that in order to make a good lawn, the first consideration is that of the two important factors of soil and seed.

SOIL AND ITS PREPARATION.

The soil for a good lawn, in respect of its quality, is not of vast importance. A very poor piece of land, if properly prepared, will in a few years support a good lawn. Soils, of course, are of many types, but it may be best to consider all soils as belonging to one of three classes. These classes are: (1) heavy or clayey soils; (2) medium loamy soils; and (3) light sandy soils. Soils belonging to the first and third classes need more preparation than soils of the second class, that is, medium loamy soils.

Soils of the first type, namely, heavy clay soils, should be, first of all drained, if possible. Drainage to a heavy soil is like fresh air to a stuffy room. The oxygen in the fresh air as it passes down through the soil, has exactly the same results on the plant growth, as fresh air has on the human system. Oxygen or air is enabled to pass through a drained soil more freely than through an undrained soil, because the water in passing down to the drains below, leaves channels through which air is sucked. In many cases where drainage is not given, sticky growth or bad winter-killing of the grasses results.

Soils belonging to the second class, that is, medium loam soils, are the best soils for lawns, and need little improvement before sowing the seed.

Soils belonging to the third class, or sandy soils, are also fairly good soils for lawns, when it is possible to add enough vegetable matter or barnyard manure to supply plant-food for several years. Such soils, however, dry out very quickly, and the grasses are more liable to be injured by drought. Where good soil is procurable, it is safer to apply a top dressing, to such soils, of about 6 inches of good loam.

GRADING, LEVELLING AND SPECIAL PREPARATION.

It may sometimes happen that the plot to be sown to lawn is very uneven in character. In such a case it has to be graded or levelled.

In the act of levelling, care should be taken to take off the

top layer of soil and keep it by itself, ready to apply as a top dressing all over the freshly-graded parts after the work of levelling is finished. Plants will seldom grow in the raw subsoil. The top soil being richer in plant food should always be kept at the surface. In filling up holes, be careful to see that the soil is well packed into them, or subsequently settling takes place and an uneven lawn is the result.

The best grade for a town lawn is to have it slope away from the house and towards the street. This prevents surface water from remaining on it after heavy showers and also gives the appearance of greater size to the lot. The levelling should be done as perfectly as possible before the seed is sown. Hand rakes are the best tools to accomplish this, and all stones, except those which are very small, should be raked off.

FERTILIZERS FOR THE LAWN.

When the soil is not of the very best quality, good large applications of farmyard manure, in a well-rotted condition, should be made just previous to the final preparation. Unless the manure is exceedingly well rotted, it may be best to apply it several months previously. One of the best of the commercial fertilizers is fine steamed bone meal. A "complete fertilizer," consisting of potash salts, superphosphates, and a little nitrate of soda, also gives satisfactory results. Such fertilizers may be applied at the rate of from 250 to 500 pounds per acre, or about one ounce to a square yard of lawn. Commercial fertilizers should not be applied during dry weather. Two or three applications during the course of the season, applied at the above rate, will generally give better results than a much larger quantity applied all at once.

HOW AND WHEN TO SOW THE SEED.

The seed should be sown when there is no wind, because the seed, being very light, is difficult to distribute evenly in windy weather. To ensure even distribution, it is best to mark off the lawn into strips about 6 feet wide, and sow fairly lightly. Then mark it off again at right angles to the first strips, and sow a second time.

Seed is best sown during one of the three following seasons: First, as early in the spring as possible, that is, as soon as the ground is dry enough to work. If the ground has been prepared the previous autumn so that all that remains to be done in the spring is to sow it to seed, the spring is perhaps the most satisfactory time to sow. The second season is during the latter part of August or early in September. Should delays hinder the early spring sowing, it is generally better to put off sowing till this season. The reasons for this are that during the months of June and July, the seed fails to germinate, or if it germinates,

the long hours of sunlight and the dry atmosphere kills off the tiny plants, whereas by September, by the aid of dew and rain, the seed germinates quickly and survives the heat of the sun far better. The third season is as late in the autumn as possible just before the ground freezes up. The object of sowing the seed at this season is to gain time in the spring. The seed will lie in the ground without harm during the winter, and will germinate very early in the spring. It must not be sown too early in the autumn, otherwise it may germinate and the young plants being tender at the start of their life, most of them will be killed off by frost. After the seed has been sown, the soil should be carefully and not too heavily raked and, with most types of soil, a final rolling will prove beneficial.

KINDS AND QUANTITY OF SEED.

From the vicinity of New York northward, the best lawn grass mixture is one consisting of Kentucky Blue grass, and a small quantity of White Dutch clover. In some cases Red Top is mixed with the Blue grass. Seed firms selling special lawn grass mixtures, generally add to these grasses some such quick germinating grass as timothy or English Rye grass. Such grasses are for temporary purposes only. The reason for this is that the permanent lawn grasses take several years to get well established, but when they do finally take possession of the ground, the best results continue for years. Where the lawn is made for the purpose of tennis or croquet, it is best to omit the clover, as this takes longer to dry out after a shower and is slightly slippery. Seed should be sown at the rate of 4 to 6 bushels per acre, according to the soil, season and mixture. Kentucky Blue grass, 5 bushels, White Dutch clover, 1 or 2 pounds, with 1 bushel of Timothy or English rye added for results the first season, is an excellent mixture. All reliable seed firms sell excellent mixtures which often give good results, but Kentucky Blue grass alone or with White Dutch clover is recommended. A piece of lawn the size of a tennis-court requires nearly a bushel of seed, or a piece 50 by 100 feet, three pecks. Grass seed is generally sold by weight, one bushel of Blue grass weighing 14 pounds.

Sometimes what is known as a "nurse crop' is sown with the lawn grasses. This generally consists of either oats or barley, and is used in order to give shade and protection to the tenderer grasses. A "nurse crop" is useful when a lawn has to be sown late in the spring. If used, it should be cut when not more than 6 inches high, and will require about three cuttings during the season.

CARE OF A NEW LAWN.

A new lawn should not be left to grow as it pleases during the first year, as is sometimes supposed. The first cutting

should take place when the grass is about 4 or 5 inches high, and a new lawn sown late the previous autumn or in the early spring should be cut four or five times during the first season. The grass is improved thereby and weeds which are bound to come up freely in new lawns are also kept in check. After the first season, most weeds will disappear, but should dandelions or plantains make their appearance, nothing less than cutting out each plant with a "spud" or pulling it up by the roots, will be effectual in keeping them in check. All other weeds, with a few exceptions, have a less persistent root system, and cannot survive one or two cuttings with the lawn mower. A good sharp scythe may be used to cut the lawn for the first few times, although a lawn mower in good condition is perfectly satisfactory, and will not pull up the grass by the roots.

WATERING AND GENERAL TREATMENT.

Should it be necessary to water the lawn, it must be well soaked at each application. Sprinkling the lawn is very bad practice, as the water does not get deep enough into the soil to reach the roots, and instead of benefitting, it causes the surface to bake in the form of a crust, which is fatal to healthy growth. Moreover, owing to the law of capillarity, far more water is lost by evaporation the next day than was added by the sprinkling.

Young lawns, and even well-established lawns, are always improved by a good rolling in the spring. Should there be any holes in the lawn, they may be filled up at this time by adding some good loam. The grass will quickly push up through soil thus added. Where leaves and other waste materials have accumulated on the lawn during the winter, such should be raked off in the early days of spring. Thorough raking will also improve the grass.

Another point to remember is, that a delay in cutting the lawn in the spring always makes the first cutting much harder work, and sometimes produces injury to the grass as well; therefore, get the lawn mower into shape during the winter, and out on the lawn as soon as it is green in the spring.

WEEDS IN LAWNS.

For getting rid of weeds in lawns, where they are apt to occur in abundance, many spray methods have been tried. The question of "weeds" has been reported on by another Division of the Farm, and the only thing that need be said here is that the two weeds previously mentioned, namely, dandelions and plantains, which very commonly occur in lawns, almost defy all methods of eradication other than that which is generally recommended, namely, spudding or cutting out by hand. Of spray mixtures, sulphate of iron has been found by some to be

effectual. In one instance it was found that a 25 per cent solution applied six times at intervals of two weeks killed out all the dandelions, the plantains, however, were not killed by it. The area of grass sprayed was entirely free from dandelions the following spring, and was rather greener in colour. It showed up in marked contrast to the surrounding areas where dandelions were growing in great abundance.

A FRONT LAWN.

The contrast views shown on the opposite page indicate what may be done to improve the appearance of the front of a house on a thirty-three foot lot. The upper view was taken soon after the house was built and before even the walk and lawn were made. The lawn is a sodded one, but could have been as well made by seeding with a recognized lawn mixture after the soil had been properly enriched and cultivated. The trees seen in the foreground on either side are of the Schwedler maple variety. They were purchased from an Ontario nursery, when about eight feet high, at $1.50 each.

The shrubs growing in front of the verandah pillars are the Hydrangea paniculata on the left, and the Spirea Van Houttei on the right. These are planted within three feet of the pillars, affording a graceful screen, which very effectivly softens the harsh corners of the verandah. The former affords a wealth of bloom from August to the arrival of frost, while the latter presents a glory of whiteness for about two weeks in the month of June.

Between these shrubs there will be noticed a semi-circular bed which bears different varieties of bedding plants from year to year. When the photograph was taken it was planted with coleus of the Golden Bedder and Verschaffelt varieties, with a border of a brilliant variety of achyranthes. Another year it bore sweet alyssum, cockscomb, and lobelia, and last year fibrous-rooted begonias with a border of sweet alyssum. This bed is planted in the autumn with tulips and presents a brilliant display from early in May until the time arrives for setting out the bedding plants.

Since the photograph was taken a row of Princess ferns has been planted next the wall, forming a graceful screen. At the left-hand pillar has been planted a climbing honeysuckle (Lonicera), and at the right-hand pillar, a climbing rose of the Tausendschon variety. A vine, it will be noticed, occupies the angle in the wall to the right of the window. A similar one is growing on the brick wall at the left of the verandah. This is a self-clinging Virginia creeper. The flower boxes are varied from year to year and consist in the main of dracænas, euonymus, geraniums, begonias, lobelia, nasturtiums, and other vines.

Just inside the fence, between the houses, there is grown

FRONT LAWN FIRST YEAR.

FRONT LAWN, TWO YEARS LATER.

each year a bed of the tuberous begonia interspersed with ribbon grass and bordered with alternanthera. The tubers are stored in dry soil in the cellar over winter and used from year to year. This bed, which is 3½ ft. by 10 ft., is planted with tulips each autumn for spring blooming. The begonias, which follow the tulips, are started in March in the cellar and forced along in the garden in well banked cold frames covered with shaded sash.

The fence seen at the right, though of neat design, is regarded as a necessary evil. Before it was erected it seemed impossible to prevent delivery people forming paths in the lawn instead of keeping to the concrete walk. The house faces the north, a matter worthy of consideration in selecting plants for bedding and flower boxes.

THE MAKING AND KEEPING OF A PRIZE-WINNING GARDEN.

The plan shown on page 17 represents the garden that won the first place in the Ottawa Horticultural Society Competition in 1914, was awarded the second position the year before and medals in the Lady Grey Competition in 1910 and 1911. This back yard, serving the purpose of a kitchen garden and a flower garden, represents landscape architectural features that may be applied to most city lots. It was but a few years ago reclaimed from a swampy depression filled with willows and other scrub growth. After the shrubbery was removed it was filled in with the best available soil obtained from cellar excavations in the vicinity. The soil was then enriched as suitable fertilizer became available. The first year only potatoes and other of the more common garden vegetables were grown. This had a good effect on the soil, facilitating the cleaning of the ground of weeds and putting it in good mechanical condition by frequent cultivation. The proprietor had little knowledge of flower gardening, but early became a member of the Horticultural Society, and in addition to securing such information from time to time as fellow members could afford, secured planting material from two memberships each year besides quantities of cuttings and plants which neighbouring gardens were willing to spare to an enthusiastic beginner. Opportunity was taken to study the perennial borders at the Experimental Farm and to learn from the officials how such a border could best be planted. The border shown in the plan is the result of this information and the experience that has been gained year by year.

THE PERENNIAL BORDER.

The fence which the border skirts is covered, during the summer season, with climbing roses and Alleghany vine, forming

THE GARDEN JUST AFTER WINTER IS OVER.

THE GARDEN DURING THE EARLY DAYS OF SUMMER

a most effective background for the border itself. The border consists, in the main, of three irregular rows planted in conformity with the recognized principles, with such plants as hollyhocks, delphiniums, perennial heliotrope and helianthus for the back. This row is continued along the end fence.

The next irregular row of he border consists of phlox, oriental poppies, iris, anemones, canterbury bells, shasta daisy, columbine, sweet william, and lilies. The irregular front row consists chiefly of daisies, pinks, alyssum, stonecrops and pansies, with here and there small groups of such annuals as are considered most appropriate. The annuals are selected for the purpose of maintaining a perpetual show of bloom of colours to blend most effectively with the perennials near them. At the side of each oriental poppy is planted, year by year, cannas which come into bloom in the middle of the season and continue until the frost arrives to cut them down. Great satisfaction has been afforded by the growing of shirley poppies throughout the whole length of the border. Early in the spring one or two five-cent packages of seed are scattered promiscuously. As the bed is being cultivated during the season the seedling poppies are preserved in sufficient numbers to cast a brilliant hue over the border for several weeks during the season. Sweet alyssum is also made use of for filling spaces in the border. This forms a very effective "peacemaker" between strong colour contrasts.

This border contains from 300 to 400 bulbs of daffodils, early and late tulips, snowdrops, Spanish iris and crocuses, which present, in the spring, a brilliant display before other flowers appear.

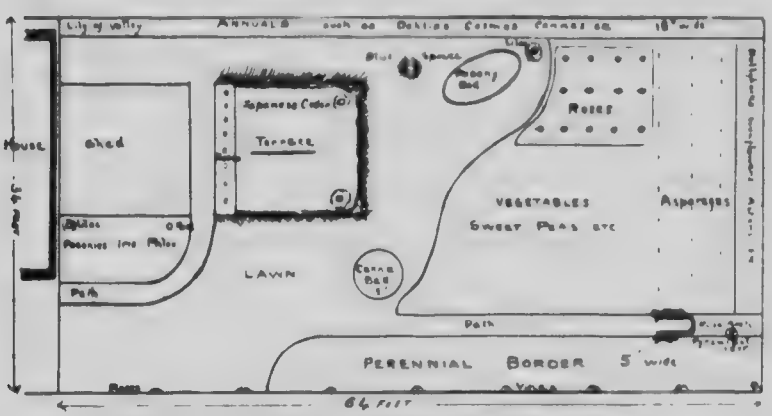
VEGETABLES AND FLOWERS.

This border is skirted by a path which is spanned at a point shown on the plan by an arch which supports a climbing rose on either side. Through this arch is seen a pyramidal cedar which very effectively screens the back fence and diverts the path at the back of the garden to the left. The break from flowers to vegetables is gradual. Next the path each year are grown a narrow space of annuals such as asters, phlox Drummondii, petunias, verbenas, etc. Then follow the vegetables, such as peas, beans, carrots, beets, parsnips, tomatoes, lettuce, etc., which occupy only a small space but sufficient is produced to supply the household during the growing season, and during the whole winter with such vegetables as carrots, beets and tomatoes which are canned. Beyond the vegetables is a rose bed which consists of three rows planted about 2 feet 10 inches apart each way, the bed containing a number of the hardy, perpetual blooming varieties recommended by the Ottawa Horticultural Society.

At the foot of the garden is a bed of asparagus which provides an abundance of this delicious vegetable from the early spring until the middle of June. Other features of the garden

are shown in the plan. In planting such plants as paeonies, iris, and lilies, no step was taken without the guidance of members of the Horticultural Society whose knowledge of these things is available to every beginner.

Along the eastern border of the garden a few climbing roses have been put in and throughout the whole length a strip about 20 inches wide is maintained for the growing of annuals. These are varied from year to year and have consisted of cosmos, cannas, nasturtiums and asters, with blocks of gladioli and such other plants as are desired for cutting purposes.



PLAN OF A PRIZE WINNING BACKYARD GARD
At 151 Carling Avenue, Ottawa

A LANDSCAPE FEATURE

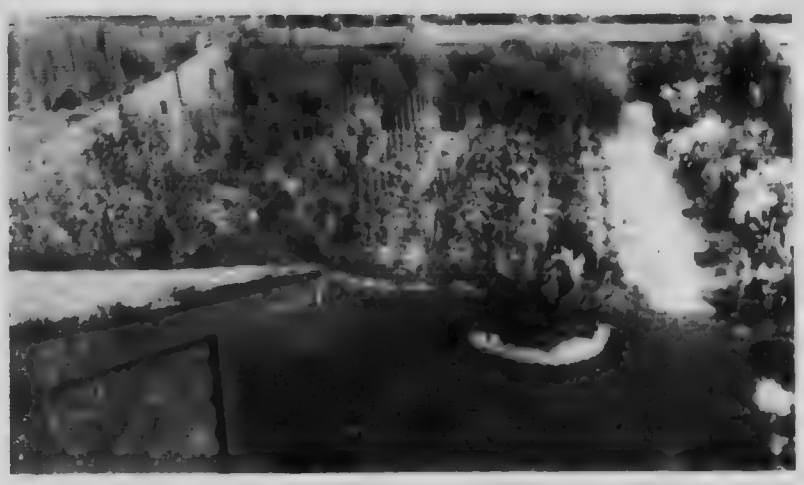
A feature that is seldom seen in a small garden and which fits in well with the landscape design is a terrace about twelve by twelve feet in extent. This is raised about fifteen inches above the level of the garden. This adjoining the shed is shown in the plan. Next the shed is a border of roses and at each of the outer corners is grown a dwarf cedar.

It is remarkable with what little difficulty a garden such as this may be established and kept in order. One has only to be careful with regard to the general plan, then take advantage of the assistance of the Horticultural Society, making such alternations and additions from time to time as judgment dictates.

POINTS TO BE OBSERVED.

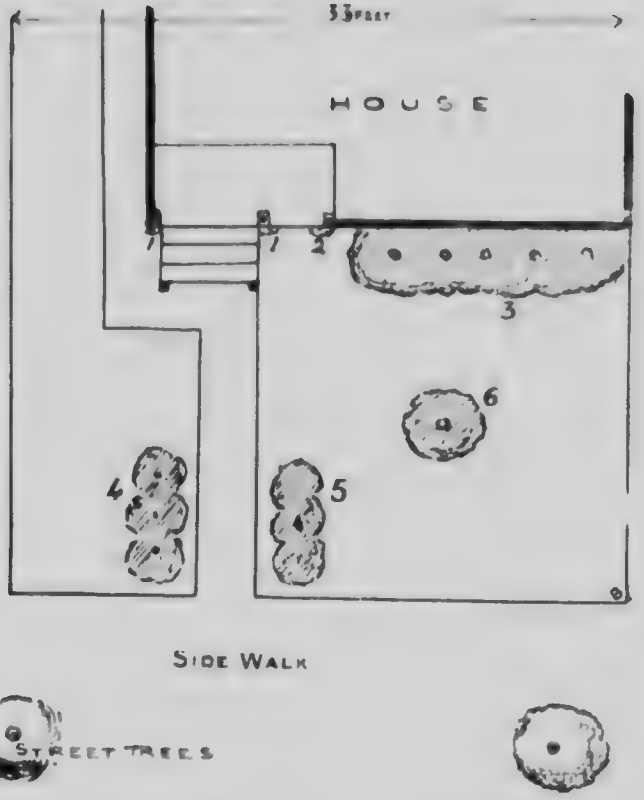
In order to secure luxuriant growth, freedom from weeds and a neatness that is pleasing to the owner and the visitor, a few general principles have to be observed as follows:

1. Enriching the soil each Autumn with a dressing of well-rotted manure, dug in late in the season, leaving the surface rough.



THE GARDEN IN MID-SUMMER.

THE GARDEN IN LATE SUMMER.



PLANTING SCHEME FOR A FRONT LAWN.

Lot 33 Feet Wide.

Scale 1 inch equals 10 feet.

CLIMBERS—

1. Two large flowering Clematis or Japanese Clematis
2. Dutchman's Pipe Vine.

SHRUBS—

3. Five Van Houtte's Spiraea.
4. Three Summer flowering Hydrangea.
5. Three Japanese Roses.
6. Autum flowering Hydrangea.

STREET TREES—

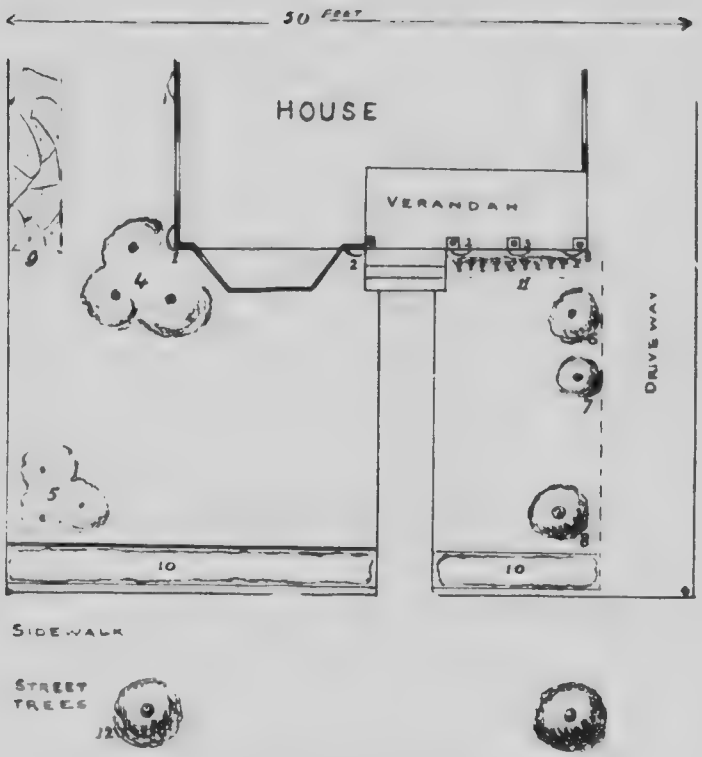
Maples or Elms.

2. Avoid going on or cultivating the ground in spring until the surface is dry or nearly so. To work over soil in a wet condition is to seriously injure its productive power for the whole season.
3. When the ground is ready and the season for planting has arrived, to lose no time in getting the seed into the ground. Discrimination must be exercised as between crops of different degrees of hardiness, for example, such crops as lettuce, carrots and peas, should be sown before it is safe to plant beans or set out tomato plants.
4. Regular cultivation should not be neglected. The whole garden, including the perennial border, should be gone over once a week. A Dutch hoe and a narrow garden rake are, perhaps the best tools for this work.
5. Watering should be done only when necessary. Daily waterings are a positive injury to garden crops. In very dry weather one good soaking in ten days, with cultivation between, should give the maximum of results.
6. Such other practices as clipping off dead bloom, removal of dying plants, the trimming of edges, the raking of walks, attention to spraying at the proper season according to authoritative bulletins, should all be observed if the garden is to become the desirable feature that it may be made.

PERENNIAL FLOWERS SUITABLE FOR GROWING IN SHADY POSITIONS.

Japanese Anemone	Anemone japonica.
Monk's-Hood	Aconitum.
Bugbane, or Snake-root	Cimicifuga americana.
Lily-of-the-valley	Convallaria.
Bleeding Heart	Dielytra.
Barrenwort	Epimedium.
Plantain Lily	Funkia, in variety.
Day Lilies	Hemerocallis.
Cardinal Flower	Lobelia cardinalis.
Virginian Cow-slip	Mertensia virginica.
Solomon's Seal	Polygonatum.
Meadow Rue	Thalictrum.
Spider-wort	Tradescantia.
Wake Robin	Trillium grandiflorum.
Periwinkle, or Trailing Myrtle	Vinca.
Ferns, in great variety	

Those marked thus will succeed in almost complete shade; the rest will do best in partial shade. Many of these are grown in the garden at 660 Rideau Street, a shady corner of which is reproduced in the photograph on page 83. Note the luxuriant growth of the Japanese anemones.



PLANTING SCHEME FOR A FRONT LAWN.

LOT 50 FEET WIDE.

Scale 1 inch equals 10 feet.

CLIMBERS—

1. Two Self-fastening Virginian Creepers.
2. Two Large flowered Clematis or Japanese Clematis.
3. Two Climbing Bitter Sweets.

SHRUBS—

4. Three Van Houtte's Spiraea.
5. Three Japanese Roses.
6. Mock Orange.
7. Large flowered hybrid Lilacs.
8. Summer flowering Hydrangea.

FLOWERS—

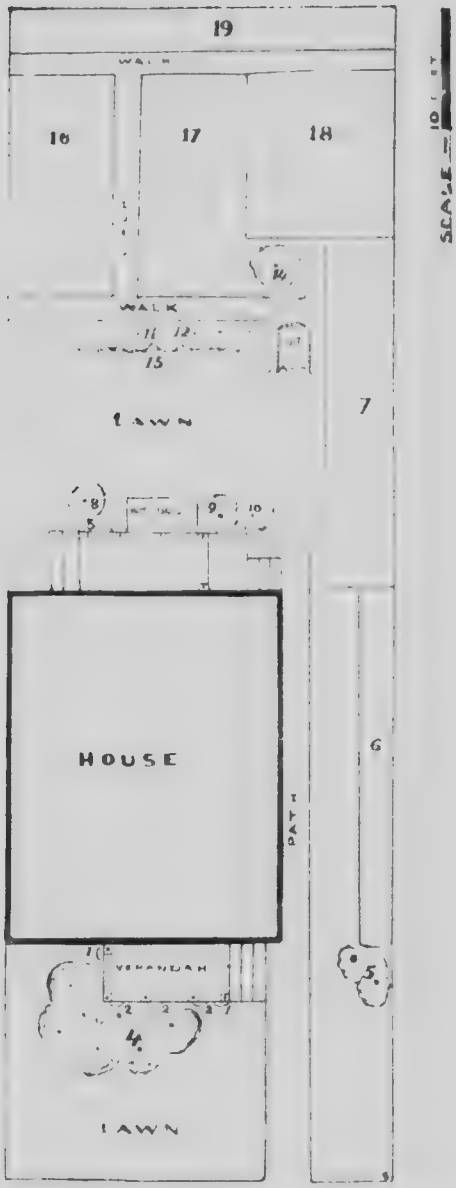
9. Perennial flowers in four foot border.
11. Twelve scarlet Geraniums, Salvias or Asters.
    Darwin Tulips planted in October for spring bloom.

HEDGE—

10. Hedge of Twenty-four Thunberg's Japanese Barberry plants.

STREET TREES—

Maples or Elms.



PLAN FOR A GARDEN OF FLOWERS, FLOWERING SHRUBS AND VEGETABLES.

LOT 33 X 100 FEET.

Scale 1 inch equals 10 feet

A 33 x 100 FEET GARDEN.

Planting Key for Lot Plan on opposite page.

CLIMBERS –

1. Two Dutchman's Pipe Vine.
2. Two large flowering Clematis or Japanese Clematis.
3. Two Self-fastening Virginian Creepers.

SHRUBS –

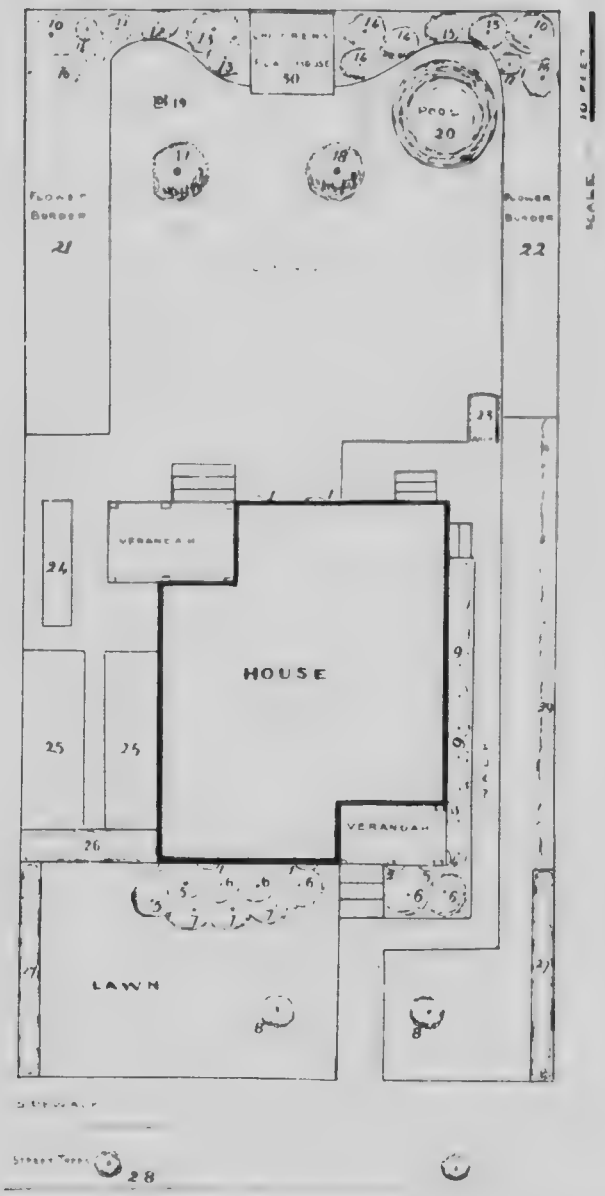
4. Four Van Houtte's Spiraea and three Spiraea arguta.
5. Two Mock Orange.
6. Sweet-scented or Golden Currant.
9. Hybrid White Lilac.
10. Hybrid Purple Lilac.
11. Five named varieties hybrid Lilacs.
12. Four Hydrangeas or four mixed shrubs.
13. Two Climbing Roses on arch.
14. Siberian Pea Tree.

FLOWERS

6. Border of Annual flowers, five feet wide
7. Border of Perennial flowers, six feet wide (See separate plan.)
15. Border of Perennial flowers in foreground of shrubs.
16. Area for vegetables.
17. Area for vegetables.
18. Area for Rose Garden or small fruits.
19. Row of twelve Raspberry canes.

WATER POOL AND ROCK GARDEN

At 15 Leonard Avenue, Ottawa.



PLAN FOR A GARDEN OF FLOWERS, FLOWERING SHRUBS, SALAD VEGETABLES, AND SPECIAL FEATURES.

Lot 50 x 100 feet. Scale 1 inch equals 10 feet.

PLANTING KEY FOR LOT PLAN ON OPPOSITE PAGE.

CLIMBERS—

1. Four Self-fastening Virginian Creepers
2. Large flowered Clematis.
3. Two Climbing Bitter-Sweet.
4. Dutchman's Pipe Vine.
25. Dorothy Perkins or Crimson Rambler Rose.

SHRUBS—

5. Two Sweet-scented Currant.
6. Five Van Houtte's Spiraea.
7. Three Summer-flowering Hydrangeas.
8. Two Autumn flowering Hydrangeas.
9. Ten or Twelve Spiraea arguta (Snow Garland).
10. Two Smoke Tree.
11. Three Snowberry.
12. Two Rose Acacia.
13. Two Mock Orange.
14. Three named hybrid Lilacs.
15. Two Bush Honeysuckles
16. Two Japanese Roses.

TREES—

17. Siberian Pea Tree.
18. Blue Spruce.
28. Elms or Maples.

SPECIAL—

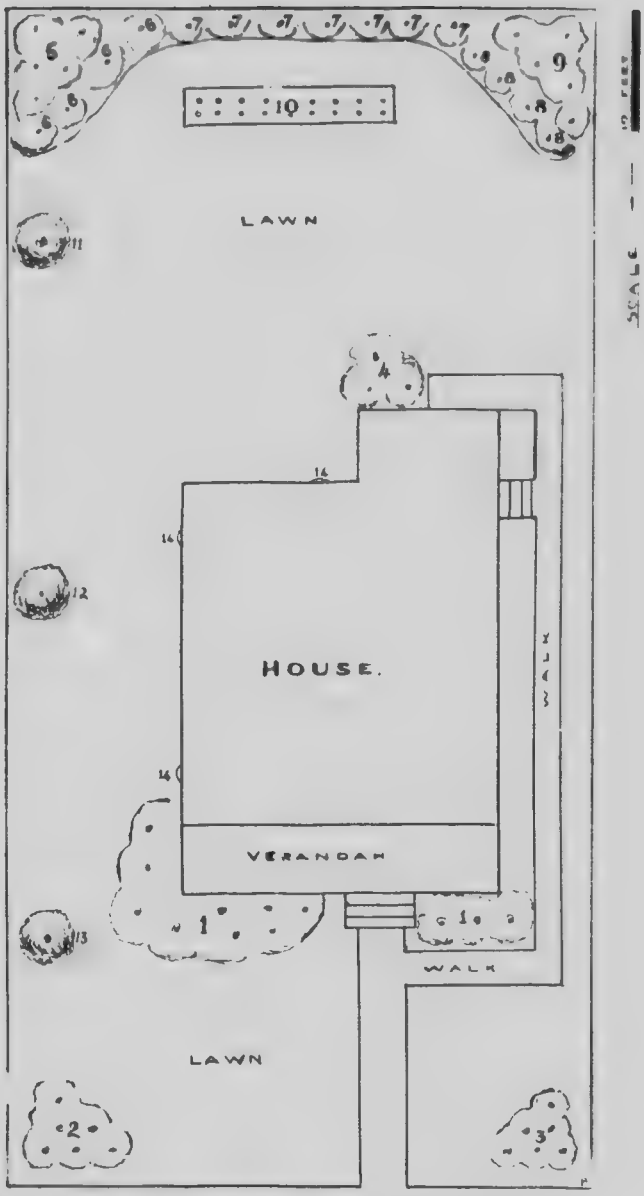
19. Bird House.
20. Pool for Water plants.
23. Rose Arch.
24. Hot-bed.
30. Children's Rustic Play House.
25. Areas for Salad Vegetables.

FLOWERS—

21. Perennial Flower Border 8 feet.
22. Border for Annuals 5 feet.
29. Border of Geraniums or Sweet Peas.

HEDGES—

26. Evergreen Hedge (8 plants).
27. Japanese Barberry hedge (30 plants).



PLAN FOR A BUSY MAN'S GARDEN.

Lot 50 x 100 Feet.

Scale 1 inch equals 10 feet.

A BUSY MAN'S GARDEN.

PLANTING KEY FOR LOT PLAN ON OPPOSITE PAGE.

SHRUBS AND SMALL TREES—

1. Twelve Van Houtte's Spiraea.
2. Six Summer-flowering Hydrangea.
3. Six Autumn-flowering Hydrangea.
4. Three Named hybrid Lilacs.
5. Five Mock-Oranges.
6. Four Spiraea arguta (Snow Garland).
7. Seven Japanese Roses.
8. Four Snowberry.
9. Five Bush Honeysuckles.
10. Rose Garden (18 roses.)
11. Siberian Pea Tree.
12. Flowering Crab Apple.
13. Ginnalian Maple.
14. Self-fastening Virginian Creeper.

AFTER THE PAEONIES ARE OVER, LILIES PERFUME THE GARDEN.

THE HERBACEOUS BORDER.

The herbaceous border is the most suitable means of furnishing continuous bloom in desirable quantity in a small garden. It economizes ground, saves cutting up what little grass there is, and makes a nice background for the lawn, no matter how tiny it may be. It is very difficult to obtain mass effects in small gardens, and, if continuity of bloom is desired, some other effect must be obtained, unless annuals which have a long blooming season are used, when masses of colour may be had; but most annuals are brilliant but not specially attractive.

For small gardens, rather than to attempt mass effects, one may have many small clumps of plants blooming at the same time scattered through the border, and so placed that they will make a good contrast, or blend with the foliage of other plants not yet in bloom, and also among themselves give a variety and pleasing contrast or blending of color.

To obtain the best results in a border, it should be wide, ten or twelve feet in width not being too much, but in an average city lot a narrow border is a necessity, hence a narrower border of from five to eight feet is suggested. The soil should be good and worked to a depth of fifteen to eighteen inches.

In beginning a herbaceous border in a small garden, with the object of obtaining the greatest continuity of bloom at the least expense in the shortest time, one should go about it in the following way: As in 99 cases out of a hundred the desire comes in the spring, let us assume that we are starting at that time of the year; prepare the border carefully, using good soil and manure it well with rotted manure. Plant nearly the whole border with annuals the first year, either sowing the seed where the plants are to be in the border or setting out the plants. At the end of the border which is least conspicuous, or in some other place if there is one available, sow seed of the following perennials of the best strains that can be obtained:—

Iceland Poppy.	Pyrethrum.
Long-Spurred Columbine.	Delphinium chinense.
Oriental Poppy.	Delphinium hybridum.
Hesperis matronalis alba	Hollyhock.
Campanula persicifolia.	Platycodon.
Foxglove.	Echinacea purpurea.
Coreopsis grandiflora.	

It would be much better if this seed were sown in the autumn, as a far larger percentage would germinate. If sown in the spring it should be got in the ground as soon as possible. Sow seed about half an inch deep in rows, four inches apart, and see that the soil does not dry down below the seeds, at least until after they germinate. If the surface soil is kept loose and weeds pulled out, there should be hundreds of plants by autumn.

It is desirable, if there is ground available, to prick out as many of the young plants as possible during a wet time in July, setting them about 4 inches apart each way.

From one, two, or three dollars' worth of seed or less many hundred plants should be obtained. The plants which are pricked out should be in splendid shape for setting out in September or early in October, and, even if they have not been pricked out, they may be planted into the border direct from the seed bed.

As soon as the annuals have been injured by frost, or before, if it is time to plant them, bulbs should be planted, and these should consist mainly of tulips or narcissus. If a good assortment of these is chosen there will be a succession of bloom from the latter part of April until the latter part of May. In our experience from 6 to 10 bulbs is sufficient to plant in a clump. Clumps should be planted irregularly from one end of the border to the other, and from the front to the back. The more clumps there are, the better the effect will be, but it may not be possible to plant all that are desirable for the first year. They should be planted so that there will be contrasts or blending of colors in adjoining clumps, and late or early tulips or narcissi should occur here and there or through the border, so that there will be an effective display all over at one time. The object of planting small clumps irregularly is that the perennials may be planted between and when they develop during the season they will hide the spaces where the tulips and narcissi had been. These small clumps of bulbs need not take the place of solid beds of bulbs, if the garden is large enough to have such. After the bulbs have been planted and an outline of the clumps marked on the surface of the soil, the seedling perennials should be taken up and planted all over the border, planting from three or more plants of each kind in a group, and bearing in mind that Iceland Poppy may be planted quite close to other plants, as it will seed freely in the border and the original plants are likely to disappear after the second season. Columbines, on the other hand, must not be crowded if they are to do their best. Oriental Poppies have heavy rank foliage and should be kept well away from weaker growing plants. As, however, the tulips will be about ready to dry up when the leaves of the poppy overshadow them, the latter may be planted near the tulips.

Hesperis matronalis alba, or White Rocket, is a most desirable plant. It is one of the few tall white-flowered perennials blooming in the early part of the season. It should be arranged so that it will come in sharp contrast with the scarlet oriental poppies which bloom at the same time.

Campanula persicifolia, the peach leaved bell flower is very attractive during the months of June One gets it in white and light and deep bluish-purple. It spreads freely and apidly seeds itself, and once in the border is always there. The yellow of the Coreopsis grandiflora makes a very pleasing contrast to

the blue and white of the Campanula. It will be remembered when planting Coreopsis that the same plant only blooms one year satisfactorily, hence they may be planted fairly close to other plants. They seed themselves freely and new plants are then easily obtained.

Delphiniums. It is difficult to say which is the more useful, the Dwarf or Chinese Larkspur, Delphinium chinese, or the Tall Larkspur, the seed of which may be obtained under the name Delphinium hybridum. The advantage of the Dwarf varieties is that they do not look out of place in any part of the border, being tall enough for near the back and not too tall for near the front. There is not, however, as great a range in color as among the tall ones

The Platycodon, or Chinese bellflower, comes in bluish-purple and white. It is a very satisfactory plant, blooming in early July and August. It does not take up much room in the border, but will hold its own once it is established. The Purple Cone Flower, Echinacea purpurea, should be used in large numbers. It is very effective in late summer and autumn when bloom is scarce. It is tall and upright in habit, and for this reason can be squeezed in between other plants. With a good supply of plants of the above flowers a good ground work for the border will be made, and there will be bloom from early in the spring until autumn. Moreover, all these plants seed themselves. Seedlings not wanted may be treated as weeds.

When the seedling perennials which have been planted bloom, the poorest should be rooted out, as more space will be needed every year for the new things and named varieties which are sure to be obtained.

There are many other plants which must find a place if the border is to look its best, but most of these will have to be bought or obtained from friends.

The seasons when it is most difficult to have good bloom is just after the bulb season in the spring and during the month of September. Hence we shall suggest more plants for spring and autumn than for summer.

One of the earliest blooming perennials is Arabis albida flore pleno, or Double Flowered Alyssum. This begins to bloom soon after the snow has gone. Its double, pure white flowers are borne in great profusion. It is low growing, increases rapidly, and is very useful for the front of the border.

No small garden is complete without a good plant of Bleeding Heart. It has a blooming season of a month or more in the latter part of May, and June, and is both striking and attractive.

Tne Epimediums or Barrenworts are very attractive spring flowering perennials, and are desirable for cutting. The varieties of Trollius or Globe flower in various shades of yellow and orange are among the best spring flowering plants, and the native

Trillium grandiflorum should be in every small garden. It thrives well under cultivation and clumps soon spread

Lily of the Valley and Forget-Me-Not are delightful spring flowering plants, but each needs a place of its own. The former, because its blooming season is short, and it spreads rapidly, and the latter because it becomes a weed in the border.

Iris florentina blooms in May, and because of its early blooming it should not be omitted; the many varieties of German Iris soon follow.

The Day Lily, Hemerocallis flava, is an attractive yellow-flowered plant, and its fine foliage makes it useful as a background for other species. Another good one is H. aurantiaca major.

Among summer blooming plants there is none more desirable than Perennial Phlox, of which there are many fine varieties. Among low-growing plants for bloom in late summer we have found that Rudbeckia Newmanni, a sort of Black-eyed Susan, is one of the most desirable. It increases rapidly, and clumps should be scattered all along the front or near the front of the border.

No lilies have been mentioned so far. They are not as necessary as some other flowers and one who wants lilies will get them anyway, but Lilium speciosum is, we believe, an absolute necessity in a small garden where continuity of bloom is desired. It flowers during the month of September, when bloom is scarce. Japanese Anemones are also desirable for late bloom, but as the first frost injures these and they do not bloom until very late they are not to be depended upon. There are many tall-growing yellow flowers, such as Rudbeckia Golden Glow, Helianthus of various species, and Heliopsis with running root stalks, but all of these should be kept out of the mixed border as they give endless work in keeping them under control. If they are used they should be treated as things apart. There are, however, some good late blooming flowers which do not spread in this way, or at least not rapidly; among these are Helianthus multiflorus maximus, Helianthus Soleil d'or, Helenium autumnale superbum, Helenium grandicephalum striatum, and some of the finest autumn flowering plants are among the Michaelmas daisies or asters, and of these Aster Novae Angliae, Mrs. Rayner, a reddish-purple flowered variety, is one of the best.

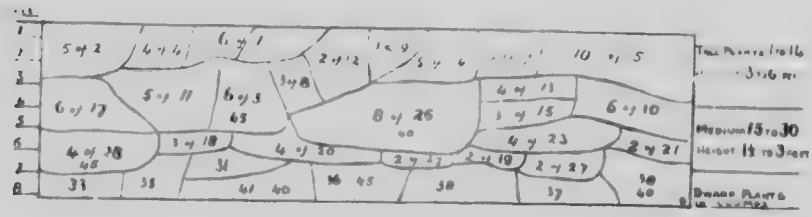
In a border where continuity of bloom is desired all the tall plants should not be put at the very back. The late blooming sorts are most of them tall, and if they are all kept in the rear there is a dearth of bloom near the front in late summer or autumn unless annuals are used, most of which do not go well with perennials.

It will be noticed that paeonies have not yet been mentioned, but there should not be many paeonies in a border in a small garden. They take up much room and are apt to smother smaller and more precious things. If planted in a bed by them-

selves provided they have abundant sunlight, good soil, and sufficient moisture, they will look well when in bloom. A border of Narcissus or Pan s along the front will give color to the bed before the paeonia bloom, and the gladioli or tall lilies may be used with good effect behind for later bloom. Gladioli are also very desirable in the mixed border, and if some are planted late will be particularly useful in September when bloom is scarce.

Annuals should play some part in a small garden, and until perennials are well established more of them are likely to be used than later on. Sweet Peas, Asters, Nasturtiums, Scarlet Salvia, Nemesia, Phlox Drummondi, Verbena, and White and Pink Petunias are good annuals, and are among the most persistent bloomers. Sweet peas should be planted where they will not be too conspicuous in late summer when the lower leaves have fallen and they have a ragged look. It may be possible to screen the lower part of the sweet pea row with some other flower planted two feet or more from the sweet peas, but which from a distance appear close to them. Beds of annuals usually become ragged in late summer, hence a border of annuals where they will not be so conspicuous would seem to be best.

Every year some re-arrangement of some of the planting in a small garden will need to be made in order to have that continuity of bloom, freedom from gaps, and the blending of foliage and flower which is so necessary in a small garden where all one's attempts may be taken in at a glance and where weak spots are quickly seen.



PERENNIAL BORDER 8 × 35 FEET PLANTING KEY OPPOSITE PAGE

"What a marvellous link a garden is between man and Nature. A plane on which we all meet, and everyone is in sympathy. The love of a garden purifies a man's mind."—*Milman.*

HARDY PERENNIALS.

BEST TALL GROWING FLOWERS FOR THE BACK OF A PERENNIAL BORDER.

HEIGHTS 3 TO 6 FEET.

COMMON NAME.	BOTANICAL NAME AND BEST VARIETIES.	COLOUR	TIME OF BLOOM.
1 Hollyhock	Althea rosea single and double in variety	Various	July-Sept.
2 Larkspur	Delphinium hybridum in variety.	Various blues	July-October.
3 Foxglove	Digitalis, in variety	White and Purple	July-Sept.
4 Sunflower	Helianthus multiflorus and hybridus.	Yellow	August-Sept.
5 Sneeze Weed	Helenium autumnale superbum	Yellow	July-October.
6 Cone Flower	Rudbeckia maxima	Yellow	July-Sept
7 Lupine-wort	Thermopsis caroliniana	Yellow	June-July.
8 Monk's-Hood	Aconitum Napellus and Fischeri	White and blue	July-October.
9 Columbine	Aquilegia chrysantha and tall varieties	Various	May-July.
10 Starwort-Aster	Aster Novae-Angliae Mrs. J. F. Ravner. Novi Belgii Margaret	Various	Sept.-October.
11 Bellflower	Campanula, in variety.	Blue and White	June-Sept.
12 Virgin's Bower	Clematis recta	White	June-July
13 Purple Cone-flower	Echinacea purpurea	Purple	August-Sept.
14 Lily	Lilium tall varieties as superbum.	Various	July-October.
15 Lupine	Lupinus polyphyllus in variety	Various	June-July.

BEST MEDIUM HEIGHT FLOWERS FOR THE MIDDLE OF A PERENNIAL BORDER.

HEIGHTS 1½ TO 3 FEET.

16 Japanese Windflower	Anemone japonica in variety	Various	Sept.-October.
17 Columbines	Aquilegia caerulea, chrysantha, and glandulosa.	Various	June-July
18 Bellflowers	Campanulas, in variety as calycanthema.	Various	June-Sept
19 Shasta Daisy	Chrysanthemum maximum King Edward.	White	July-October
20 Tickseed	Coreopsis grandiflora	Yellow	June-October

HARDY PERENNIALS.

21 Chinese Larkspur	Delphinium cashmirianum or chinense	Blue, white	July-August.
22 Gas Plant	Dictamnus albus and purpureus	White, purple	June.
23 Blanket Flower	Gaillardia magnifica, aristata	Variegated	June-October.
24 Day Lily-Lemon Lily	Hemerocallis, flava, fulva, etc	Yellow, orange	June July.
25 Scarlet Lychnis	Lychnis chalcedonica	Scarlet	June-August.
26 Paeony	Paeonia, in great variety	Various	June.
27 Poppy	Papaver, oriental, in variety	Scarlet	June.
28 Phlox	Phlox paniculata, in great variety	Various	June-October.
29 Chinese Bellflower	Platycodon grandiflorum	White, blue	July-August.
30 Feverfew	Pyrethrum hybridum, in variety	Various	June-August.

BEST LOW-GROWING FLOWERS FOR THE FRONT OF A PERENNIAL BORDER.

Heights 6 to 18 Inches.

31 Columbine	Aquilegia oxysepala and dwarf types	Blue, various	May-June.
32 Rock Madwort	Alyssum saxatile	Yellow	April May.
33 Rock Cress	Arabis, albida and alpina	White	May-June.
34 Harebell	Campanula carpathica	Violet	June.
35 Pinks	Dianthus plumarius Mrs. Sinkins, caesius, deltoides glaucus, and chinensis	Various	June-July.
36 Sweet William	Dianthus barbatus	Various	June-July
37 Candytuft	Iberis sempervirens in variety	White	May-June
38 Flag	Iris, in variety	Various	May-June
39 Forget-me-not	Myosotis alpestris Victoria	Blue	May-July
40 Daffodils	Narcissi, in variety	White, yellow	May-June
41 Iceland Poppy	Papaver nudicaule	Yellow, white	May-July
42 Moss Pink	Phlox amoena and subulata	Various	May-June
43 Wake Robin	Trillium grandiflorum	White	May.
44 Globe Flower	Trollius asiaticus plenus and europaeus	Yellow	May-June
45 Tulips	Tulips, Cottage and Darwin in variety	Various	May-June

(See plan of border in previous article on Perennials.)

NOTE.—See also varieties of flowers recommended in article "Herbaceous Border" and for a complete list of hardy perennials see Bulletin 58S., "Herbaceous Perennials," free on application to the Central Experimental Farm, Ottawa.

BULBS.

From the time when the first bare ground permits the dainty Snowdrop to show its welcome head, until the end of May, when the last of the gorgeous Darwin Tulips close the display of spring bulbs, there is a constant succession of lovely flowers, for closely following the Snowdrops are the Crocuses and Scillas, then the Hyacinths, and Narcissus in great variety.

While the varieties of Narcissus are still in their prime, the early Tulips begin to bloom, and these, with their brilliant color, make a delightful contrast with the Narcissus. By having a good assortment of Tulips, flowers may be had throughout the month of May, and sometimes will into June, as later blooming varieties keep up a constant succession.

Not only can a succession of flowering bulbs be had in the garden, from the time the snow melts until June, but in the home, by judicious selection and care, flowers can be obtained from the end of November until the spring, with the Chinese Sacred Lily, Paper White Narcissus, Roman Hyacinths, Freesias, Narcissus, Dutch Hyacinths and Tulips, which may be forced in the order given.

WHAT BULBS ARE AND WHAT THEY MAY BE EXPECTED TO DO.

In order that one who grows bulbs, or intends to do so, may get the best results, he should know what bulbs are, and what they may be expected to do if treated in the right way. The bulbs recommended here may be briefly described as fleshy, under-ground buds, from which roots develop in autumn, and leaves and flowers in spring. Most of the bulbous plants mentioned here are grown in Holland, and hence are known as Dutch bulbs, although they are now being grown commercially in England, Ireland, and the United States—some of them are grown in France. These bulbs make rapid growth in early spring, produce leaves and flowers, and die down; the roots wither up, and the bulbs become dormant, after which they are dug, cleaned and prepared for shipment. During their period of growth the flowers for the next season are formed **in the bulb,** and sufficient food and energy are stored up in it to cause rapid development when the proper time and conditions come. Knowing that the flowers are already formed in the bulbs before they are planted, the person who proposes either to grow them in the garden or pot them for the house can easily understand that large, well-developed bulbs are likely to give better flowers than small ones, and when ordering, this should be taken into consideration. No amount of care or high culture can add any more blooms to a hyacinth spike than were formed when the bulb was growing in Holland.

SOIL.

Most of the hardy spring-flowering bulbs thrive best in well-drained, loamy soil, with a tendency to sandy loam; in fact all the bulbs described here will succeed well in such soil. In preparing the soil, which should be dug to a depth of 12 to 15 inches, well-rotted manure should be thoroughly incorporated with it to get the best results, but it is preferable to apply it the spring before planting, or if put on in the fall, it should be buried deep enough to prevent it coming in contact with the bulb. Pure manure, when it comes in contact with the bulbs, sometimes causes them to rot, or to become diseased. The advantage of having soil which is thoroughly drained is well shown after a wet season, when Tulips, especially frequently rot badly in the soil when it remains wet for a long time. This rotting of bulbs in the soil has caused the recommendation to be made of lifting Tulips, drying them off, and replanting them again in the autumn. This advice is good, but it is not necessary when the soil is suitable. This matter, however, will be referred to in the following pages.

PLANTING.

Although the bulb when bought has the future flower and considerable energy stored up in it, this energy will not be exerted to the full unless the conditions are made favourable, and this is brought about by the development of a good root system to furnish moisture and some plant food, but especially the former. In order to get a good root system, the bulbs should be planted early enough to give the roots time to develop before winter. Failure in having good flowers in the spring is often due to the fact that the bulbs have too few roots. By planting during the latter part of September and early October, bulbs will have ample time to get well rooted before winter, but if through some cause planting is delayed until shortly before winter sets in, a heavy mulch of straw, or strawy manure or leaves, should be placed over the surface of the ground to prevent freezing, and to permit the roots to go on developing until well into winter.

Tulips, Narcissus and Hyacinths should be planted from four to six inches deep, to the bottom of the bulb, and about the same distance apart, while the smaller bulbs, such as Snowdrops, Crocuses, and Squills, may be planted about two inches apart, and from two to three inches deep. If the soil is clayey, or if there is manure in the soil which is not thoroughly mixed with it, it is advisable to put a little sand under each bulb, which will prevent rotting.

Single rows should be avoided in planting bulbs, as they are much more effective in masses or groups. Tulips and Hyacinths are usually planted in beds in large masses, their place being

taken by annuals later on. They can be used with good effect, however, in small clumps in the perennial border, and make a fine show in the spring before many of the perennials are in bloom. Planted in this way, there need be no large bare places in the border without bloom after the bulbs have done flowering.

WINTER PROTECTION.

Not only is a mulch of straw, or strawy manure, or leaves, useful for keeping out frost to permit root development, but it is necessary in this cold climate to give the bulbs some protection from the changes of temperature in winter which, if there is no snow on the ground, often do more harm than intense cold, as they cause a heaving of the bulbs, which breaks the roots from the bulbs with the result that the flowers are very unsatisfactory. The mulch should be gradually removed as soon as the snow goes in the spring, as Tulips make such early and rapid growth that they may be broken in removing it, if left longer.

TULIPS.

CULTIVATION.

The Tulip is unrivalled among hardy spring flowers for brilliancy and variety of color, and for this reason, and because of the ease of cultivation and low price of the bulbs, it has been planted more largely than any other. No bulb is as satisfactory for bedding as the Tulip, as the bright colors and strong contrasts are most effective. If Tulips are in suitable soil they may be left undisturbed for three or four years, or until they get too crowded to produce good flowers, or have died out so much that they need to be replaced; but as a rule, the best flowers are obtained by planting new bulbs each year, and this is almost a necessity for show beds to ensure perfect satisfaction, and for this purpose, it is important to use varieties which bloom at the same time, and the heights of which are known. As soon as the petals have fallen, the seed pods should be removed, in order to conserve the energy of the plant, which would be used in developing seeds instead of the bulb, but the stem and leaves should not be cut until they have dried up as they are necessary to the proper maturing of the bulb. As soon as the stems and leaves have died, the bulbs may be dug up, cleaned, and kept dry until autumn, or if the bed is needed for annuals, they may be dug up shortly after they have done flowering, and heeled-in in a partly shaded place, so that they will dry up gradually, in order to get them as mature as possible. Annuals may be planted over, and between, the bulbs in the beds, or in the border, without injury to the bulbs.

VARIETIES.

There are hundreds of named varieties of Tulips which are recommended for planting outside, but the kinds in the lists

SPRING TIME IN THE GARDEN

which follow have been found by the writers to be the most beautiful and reliable of the many tested. These varieties vary greatly in height, and this point should be studied when arranging them in the bed or border. They also have a blooming period of about four weeks, usually beginning early in May, and it is important to have a number of varieties, so that there will be an uninterrupted succession of flowers; hence, those recommended are divided into several groups in order to aid the intending planter; Early Single, Late Single, Early Double, Late Double, Parrot Tulip, Darwin Tulip, Cottage, Bizarres, Byblooms.

NARCISSUS.

The Narcissus is not nearly as well known in Ottawa, or, in fact, in Canada, as the Tulip. This may be due to the fact that many persons think that it is not very hardy. It is certainly not because it lacks beauty, as there is no spring flower which has the breath of spring so much about is as the Narcissus, nor is there any which is more delicate, chaste and graceful. If the proper varieties are chosen, they will be found as hardy as Tulips, and some of them multiply even more rapidly. The blooming season of the Narcissus is about as long as the Tulip, but early varieties begin to bloom from one to two weeks sooner, the first flowers usually being out during the last week of April. Narcissus bulbs should be left undisturbed in the ground as long as they continue to produce good flowers and most of the varieties recommended will do so for five years, or even longer. If it is desired to increase the clumps or to make new ones, they may be dug after a few years, and the bulbs separated and given more room, when they will multiply again with renewed vigour.

There are many hardy varieties of Narcissus, but in the following list a few of the best only are given, in order to avoid confusion. Once the desire to plant the Narcissus is aroused, by seeing the very best, other kinds may be obtained. The varieties recommended increase from year to year, some of them much more than others.

In the following list the varieties are arranged, approximately, in order of blooming, but some bloom almost or quite at the same time. By planting all the varieties recommended, there will be a blooming season of from four to five weeks.

HYACINTHS.

The Hyacinth is not used for bedding purposes as much as the Tulip, as it is not quite as reliable, but a good bed of Hyacinths is a very pleasing sight in early spring. The colors of the Hyacinth are so delicate, and the perfume so sweet, that it well deserves the popularity which it enjoys. For bedding purposes, new Hyacinth bulbs should be purchased every year, as the climate in Ottawa is not favorable to the development of bulbs

which will throw a good spike of flowers. In the garden the bulbs may be left in the ground from year to year, where they will often increase, and furnish a good supply of bloom, even though the spikes are not of the largest size. Hyacinths are not as hardy as either Tulips or Narcissus, and beds should be mulched in the autumn without fail.

MISCELLANEOUS BULBS.

There are a number of beautiful, interesting hardy spring flowering bulbs in addition to the Tulip, Narcissus and Hyacinth, but it is only possible here to refer to some of the best of them.

SNOWDROPS.

There is first of all the Snowdrop which, as the earliest flower of spring, is very popular and being quite cheap can be procured by everybody. The species known as *Galanthus Elwesii* is the most satisfactory. It is desirable to plant the Snowdrop in a spot where the snow goes off early so that the flowers may be obtained as soon as possible. These bulbs should not be planted more than two inches apart if an effective display is desired.

CROCUS.

The Crocus is a gaily colored little flower which blooms soon after the Snowdrop. The bulbs should be planted in masses in the border or around the trees or shrubs. The effect is also very pleasing if they are planted in the lawn, a small piece of sod being cut and raised, and a small hole made for the bulb and the sod replaced. In the spring the Crocus will thrust its way through the grass and bloom well, and by the time the grass is cut first the blooming season will be about over.

SCILLAS OR SQUILLS.

These little flowers are very striking in early spring owing to their intense blue color, and as the bulbs are very cheap they should be in every garden. The species known as *Scilla sibirica* is the most satisfactory, although *Scilla bifolia* is also good. Late in May, *Scilla campanulata* blooms, and as it is at a time when the spring bulbs are nearly over, it is much appreciated. It is a larger growing plant than the early flowering species, but although it is quite attractive, the flowers are of a duller blue than the others. There is a white variety, *Scilla campanulata alba*, which should be planted for contrast.

CHIONODOXA

(*Glory of the Snow*).

This is another graceful and pretty early spring flowering bulb closely related to the Scilla, and is very desirable. It may

be grown like the Crocus in the lawn with very good results. The species *Chianodoxa Luciliae* is the one usually planted, but the flowers of *Gigantea* are larger.

GRAPE HYACINTHS (MUSCARI).

The Grape Hyacinths are hardy, graceful little bulbs, and as they are very cheap, everyone who loves flowers should have some. The blue and the white varieties make a striking contrast when growing together.

FRITILLARIAS.

There are two species of Fritillarias which are grown more largely than others, namely, *Fritillaria imperialis*—Crown Imperial—and the Guinea Hen Flower or Common Fritillaria,—*Fritillaria Meleagris*. The Crown Imperial is a great surprise in plant development in the spring. As soon as the snow is off the ground it is seen pushing its sturdy head above ground and within three or four weeks is 2½ to 3 feet in height, and is very conspicuous, with its cluster of yellow or orange-red flowers. The Common Fritillaria, while not so striking a plant, because much smaller, is very graceful, and is quite desirable; the white-flowered variety is also attractive. There is a beautiful Siberian species, *F. pallidiflora* with greenish-yellow flowers, a free bloomer and quite hardy, which should be more generally planted.

EREMURUS.

The Eremurus has not been grown much about Ottawa yet but promises to become a very popular spring flowering bulb. The varieties *E. himalaicus robustus* and *E. Elwesii* are two of the best. The flowers are numerous and are borne on a spike, with a stem four to five feet long.

GROWING BULBS INDOORS.

The culture of bulbs indoors is one of the most delightful pastimes in winter, and there is nothing in floriculture which so well repays the lover of flowers for the money invested, and for the time and care spent upon them. By having the right varieties, and by forcing them properly, flowers may be obtained from the latter part of November until spring.

SOIL.

The mistake has often been made by those who have written on bulb culture for the amateur, that too much stress has been laid on the kind of soil in which the bulbs are to be grown, and definite proportions of sod, manure, leaves and soil have been recommended without giving any alternative to the intending planter. The difficulties in cities of obtaining these ingredients

has no doubt deterred many people from growing bulbs who would have done so if it had been made plain to them that they could have good success without preparing the soil in the exact way laid down. As has been stated before, the bulb has within it the future flower, which was formed during the previous spring; it has also food and energy stored up in it ready to be used when the right conditions are brought about, which are: first, moisture and coolness to produce roots, and then sunshine and heat to develop the leaves and flowers.

While the bulb does, no doubt, take up plant food from the soil when forced, roots and moisture are of far greater importance. A soil should first of all be porous, so that air is admitted freely to the roots; a soil which becomes compact and hard is the poorest kind. It should also retain water fairly well, and for this reason it is well to have some humus, which is supplied by rotted leaves, rotted manure, or rotted sod. Good, loamy garden soil is quite satisfactory without the addition of any fertilizer, but if it is a soil that becomes compact, it is advisable to add a little coarse sand to make it more porous. Where soil is difficult to get, excellent results have been obtained by using pure building sand for this purpose, which, being coarse, is porous, and does not become compact. This must not, however, become confounded with the ordinary fine sand, which is not satisfactory.

PLANTING.

The bulbs recommended should be planted as soon as received, or not later than the middle of October. As a good root system is very essential, the earlier the bulbs are planted the better, as most bulbs take from six weeks to two months or more to fill the pots with roots. Successive plantings are not recommended, as the bulbs lose vitality the longer they are out of the ground.

Hyacinths succeed best in five-inch pots, or if pans are used, several bulbs may be planted in one pan. Three tulips in a five or six-inch pot are very satisfactory. Most of the Narcissus also succeed well with three bulbs in a six-inch pot, but some of the larger bulbs are more satisfactory with one bulb in a five-inch pot. Seven or eight Freesia bulbs may be planted in a six-inch pot with success, and other small bulbs in the same way.

To plant the bulbs, put a piece, or several pieces, of broken pot or charcoal, or even coal clinkers, in the bottom of the pot for drainage, fill the pot or pan with soil, and shake it down by striking the bottom of the pot against something, but avoid pressing down the soil in the pot before planting the bulb, as if the soil in the lower part of the pot is firm, the bulb will be forced out of the pot when it begins to root. Now, place the bulb or bulbs on the surface of the soil, making certain to have the right side up, and press down until the upper side of the

bulb is on a level with the surface of the soil, then firm the soil about each bulb with the fingers, and level the surface. When the bulbs are planted, the soil should only come to within about three fourths of an inch of the top of the pot, so that when watering there will be room for a good supply.

ROOTING.

As the proper rooting of the bulbs is, perhaps, the most important feature in the successful culture of them, a paragraph is devoted to it. The recommendation is frequently made to give the bulbs a thorough watering at the time they are planted, keep them in the cellar or some cool place for six or eight weeks and then begin to force them. This advice, without more explicit directions, has been the means of spoiling thousands of fine blooms. There are hundreds of people in Ottawa and other cities who have no place to put their pots, while the bulbs are rooting, except the coolest part of their cellar, in which is the furnace, which keeps the air as dry almost as upstairs; and even a cool closet is sometimes the best place that can be found. The result is that the amateur, who has not had any previous experience, or who has not learned the cause of previous failures, gives his bulbs a thorough watering, as recommended, and thinks all will be well, and he is led to believe this by seeing the shoots pushing up. When he tries to force his bulbs, he finds that something has gone wrong, but he does not know what it is. What has really happened? The air of the cellar being dry, the soil in the pots has gradually dried up so that by the end of a couple of weeks or perhaps more, it is apparently quite dry and not suitable for the development of roots, and they do not develop, and perhaps some roots which had started have dried up again. One watering is sufficient where pots can be kept in a cool, moist place, but they should be watered once a week, and if necessary oftener, if they are kept in a dry cellar. The soil should not be soaked at first, as bulbs, when in the dormant condition, are likely to rot if kept too wet. The soil should be kept moist, not wet. If through careless planting the bulbs push up when they begin to root, the best plan is to repot them, rather than attempt to push the bulb back into its place. When rooting, the bulb should be kept in a dark place, between 35 degrees and 40 degrees F., if possible, and if they cannot be kept as cool as that, the lower they are kept above this the better. If kept in a high temperature, growth begins above before there is a good root development, and this is something that should be avoided, if at all possible. Furthermore, unless kept very cool, the bulbs will make too much growth, and it will not be possible to keep them back, and the bloom will be over before the end of the winter.

FORCING.

The beginner in the culture of bulbs is tempted to bring some of his

pots upstairs as soon as there are signs of growth, and is usually disappointed when he tries to force or get them to develop quickly—the flowers, when they do open, having little or no stem, and the whole plant a stunted appearance. The trouble is either that too few roots have formed, and when the plant is brought up the top develops more quickly than the roots, and there is not enough moisture taken into the bulb to cause a thrifty growth, or else the bulb is not ready to be forced (for it is not possible to force a Tulip, for instance, for Christmas, even if well rooted), and by the time it should bloom well the plant is not in condition to produce a good flower. The pot should be nearly full of roots before the bulbs are brought upstairs, and it will take from six weeks to two months to bring this about. To find out whether the bulbs are sufficiently rooted, turn the pot upside down and strike the edge against something, at the same time holding the hand over the bulbs to receive them with the soil attached to them for if the soil is of the right texture, and fairly moist, it and the bulbs will turn out without any difficulty. If roots show well all round the outside of the soil, the bulbs are sufficiently rooted, and the bulbs and soil are put back in the pot without any disturbance of the roots. The number of pots that it is desirable to force first may now be brought up, and if it is possible to put them at first in a room where the temperature is not much above 50 degrees F., until they begin to grow well, much better results will be obtained than by bringing them into the living room, where there is a temperature of 70 degrees F. or thereabouts. Sunshine is very essential to successful bulb culture, and even if the bulbs are well rooted, they will not do very well unless they have plenty of unshine while they are being forced, especially in the early part of the winter, as later on, when it is difficult, if not impossible, to keep the bulbs from growing in the cellar, they may be left there until the buds are well developed, when, if they are exposed to light for a few days, they will flower quite satisfactorily. As soon as the bulbs begin to grow well, they should be kept well watered; in fact, the soil should be soaked most of the time, while at first when they are making little growth, it is not necessary nor advisable to give them so much water. There are no plants which respond better than bulbs to a liberal supply of water when they are growing well.

Flowers will last about twice as long in a cool room as they will in a warm one. Individual flowers will stay in good condition for ten days and more if the room is cool. The order of forcing the bulbs recommended for the house is: Freesia, Chinese Sacred Lily, Paper White Narcissus, Roman Hyacinth, Narcissus, Dutch Hyacinth, Tulip.

A few notes are herewith given regarding the different

kinds of bulbs, and any special method of culture for them, with the list of varieties recommended.

HYACINTHS.

Hyacinths are very popular for forcing, this being partly due to the fact that they force easily, and partly because they are sweet scented and very attractive. The Roman Hyacinth is one of the easiest bulbs to bloom in the house, and may be had in flower by the first of December if planted early. The single, white-flowered variety is much the most satisfactory. It is very graceful, and has a delicate perfume. The earliest of the Dutch Hyacinths will not bloom satisfactorily before the middle of January, and it will be found unsatisfactory to try and get them to do so. They should be well rooted before bringing up. Hyacinths may also be forced in water, and Hyacinth glasses may be obtained especially for this purpose. The bulb rests near the top of the glass, enough water being kept in the latter so that the bottom of the bulb is just touching it. The bulbs should be kept in a dark, cool place until they have thrown out roots, when they may be brought up and forced as in the soil. It is not necessary to change the water, but it is important to keep the glass well filled with it. A piece of charcoal is useful in keeping the water pure, but it is not actually necessary. Forcing in glasses is not as satisfactory as forcing in pots, and it is not recommended for the beginner in bulb culture.

NARCISSUS.

The Narcissus is a very easy bulb to force, and this is especially true of the so-called Chinese Sacred Lily and the Paper White Narcissus, which may be had in bloom during the last days of November, or early in December, and may be forced more quickly than others. They root readily after planting, and need not be kept as long in the cellar as most bulbs. In fact, the Chinese Sacred Lily may be forced as soon as potted. They need plenty of water. Double Van Sion, Trumpet Major and Golden Spur force sooner than some of the others, and may be brought up in the order named. Good flowers may be produced by the latter part of January.

Narcissus poeticus and its varieties are more difficult to force than most others, and if tried, should be kept back as long as possible.

Like Tulips and Hyacinths, a good succession of Narcissus blooms may be kept up until spring by having the varieties recommended, and bringing the pots up gradually.

TULIPS.

The amateur usually finds greater difficulty in forcing Tulips than either Hyacinths or Narcissus, the principal reason

being that he tries to force them too early, as the Tulip starts to grow early in the pot, and looks as if it should be forced. Tulips should not be brought up to be forced until January, and then they should be forced as gradually as possible. Good flowers need not be expected until February. The pots may be brought up at intervals to get a succession of bloom. Toward spring the bulbs will make considerable growth in the cellar, but one need not be alarmed, as even if the buds are quite large before they are brought up, they will produce fine flowers. Blooms will last longer if the petals are kept from expanding fully, by means of thread tied around the flower. Nearly all the early flowering Tulips force well, and as the Tulips which look best in the garden are just as attractive inside, the same varieties in most cases can be used for both purposes.

FREESIAS.

The Freesia is one of the most charming and graceful of the winter flowering bulbs. It has a delightful and penetrating odor, and one flower will scent a whole room. Unlike the other bulbs recommended for winter bloom, the Freesia does not require to be well rooted before forcing. The most satisfactory results are obtained by leaving the bulbs in the cellar for a few days only, until roots begin to push out, and then bring the pots up and force them. They may be even forced with good satisfaction by bringing the pots into a warm room as soon as the bulbs are planted. The soil should not be very wet until they are growing thriftily as there will be danger of rotting the bulbs.

Many a beginner has thrown out his pot of Freesias in disappointment at no flower buds showing, while had he had patience they would soon have rewarded him with an abundance of bloom. Freesias should be started in August, if the bulbs can be obtained, and even if kept growing steadily no flowers need be expected before the last week of December, unless Bermuda grown bulbs, which can be had early in July, are purchased, when flowers should be produced a little earlier. Six to eight Freesia bulbs in a six-inch pot will make a fine show, and will well reward the patience of the person who cares for them. From a pot of six bulbs, one of the writers had 124 flowers, and these from bulbs forced in an office window. As the plants grow tall before blooming, they should be supported by a wire. A very convenient way is to take a fairly stiff piece of wire, and bend it so that it will encircle the plants, and have a straight piece for pushing into the soil.

MISCELLANEOUS BULBS FOR THE HOUSE.

There are other bulbs in addition to those mentioned in the foregoing pages which can be forced quite successfully,

such as the Crocus, Scilla, Tritelia, &c., &c., but they are of less importance, and most of them require greater care. After one has had experience in growing Hyacinths, Narcissus, Tulips and Freesias, it will be found very interesting to try forcing some of the other bulbs.

NARCISSUS

Variety	Colour	Garden	House	Order of Forcing
Trumpet Section				
Emperor	large trumpet, yellow	X	X	6
Victoria	creamy yellow, perianth yellow, trumpet	X	X	5
Empress	white, perianth, yellow trumpet	X	X	5
Double Van Sion	double yellow		X	4
Golden Spur	yellow perianth and trumpet		X	5
Princeps	sulphur yellow perianth, yellow trumpet		X	5
Madame Plemp	white perianth, large golden yellow trumpet	X	X	
Madame de Graaf	white	X		
Incomparabilis Section:				
Sir Watkin	perianth primrose, cup yellow	X	X	4
Cynosure	primrose perianth, orange scarlet cup	X	X	7
Stella	white perianth, yellow cup	X	X	7
Barrii Section:				
Albatross	white perianth, cup yellow edged with orange			
Conspicuous	yellow perianth, cup orange scarlet	X	X	6
Seagull	white perianth, yellow cup	X	X	4
Poeticus Section:				
Poeticus grandiflora	pure white with reddish eye	X		
" ornatus	pure white, with scarlet margin about eye	X	X	7
" Glory	pure white, cup yellow with reddish edge	X	X	7
Miscellaneous:				
Chinese Sacred Lily	white with yellow cup		X	1
Paper White	pure white		X	2

HYACINTHS.

Variety.	Colour	Garden	House	Height Inches
	(Single pink and rose			
Charles Dickens	rosy pink	X	X	
Gigantea	blush pink	X	X	
Norma	rosy pink, large flowers	X	X	
Sarah Bernhardt	deep rose	X	X	
Baron Von Thuyll	pink		X	
	(Single red			
General Pelissier	deep crimson	X	X	

Variety	Colour	Garden	House	Height Inches
Lord Macaulay	rose, with carmine stripes	X	X	
	(Single white)			
Alba Superbissima	pure white, large spike			
La Grandesse	pure white, the best white	X	X	
Queen Victoria	pure white			
	(Single blue)			
Enchantress	porcelain blue	X	X	
Grand Maitre	deep porcelain blue	X	X	
King of the Blues	deep glossy blue	X	X	
Grand Lilas	porcelain blue	X	X	

EARLY SINGLE TULIPS

Variety	Colour	Garden	House	Height Inches
Gold Finch	golden yellow, sweet scented	X	X	
Keizerskroon	crimson-scarlet with broad yellow margin	X	X	14
Joost Van Vondel	crimson flaked with white, large flowers	X	X	10
Joost Van Vondel White	pure white, large flowers	X	X	10
Proserpine	rich rosy carmine	X	X	12
Vermilion Brilliant	bright vermilion	X	X	10
Couleur de Cardinal	bronze-scarlet	X	X	11
Cottage Maid	white bordered with rosy pink	X		9
Duchess de Parma	orange red with broad yellow edge.			
Rose Grisdelin	pink on white	X	X	10
Thos. Moore	orange, sweet scented crimson	X	X	14
Primrose Queen	primrose, delightful shade	X	X	
Pink Beauty	deep rose and white	X		12
Prince of Austria	orange-scarlet, sweet scented	X	X	14

EARLY DOUBLE TULIPS

Alba Maxima	pure white	X		medium
Couronne d'or	orange yellow	X	X	"
Helianthus	red and yellow	X		"
Imperator Rubrorum	crimson scarlet	X	X	"
Murillo	blush pink	X	X	"

LATE SINGLE TULIPS INCLUDING COTTAGE

Retroflexa	pure yellow, reflexed petals, graceful	X		"
Macrospeila	brilliant scarlet with black and yellow base, sweet scented	X		"
Fulgens	crimson scarlet with yellow base	X		tall
Golden Crown	golden yellow, edged with crimson	X		medium
Snowdon (Le Candeur)	pure white, becoming suffused with pink	X		"

Picotee	waxy white with faint pink edge	X		"
Goldflake	bright orange scarlet flaked with yellow, sweet scented	X		tall
La Merveille	orange scarlet	X		medium
Gesneriana Spathulata	rich crimson scarlet, blue black base	X		Tall
Maid of Holland	cherry red, striped with yellow	X		medium
York and Lancaster	white with deep margin of rose	X		"
Sunset	orange red and yellow	X		"
Inglescombe Yellow	yellow	X		tall

LATE DOUBLE TULIPS

Variety	Colour	Garden	House	Height Inches
Mariage de ma Fille	white feathered with cherry crimson	X		Tall
Rose Pompon	pale yellow well flaked with pink	X		medium
Yellow Rose	golden yellow, sweet scented	X		"
Paeony Rose	scarlet	X		"

PARROT TULIPS

Cramoisie Brilliant	deep crimson	X		"
Lutea Major	golden yellow	X		"
Perfecta	yellow, feathered with scarlet	X		"
Bizarres-Mixed.				
Byblooms-Mixed.				

DARWIN TULIPS

Variety	Color	Garden	House	Height Inches
Isis	vivid scarlet vermilion	X		Tall
Whistler	" "	X		"
Farncombe Sanders	vivid cochineal red	X		"
Prof. Rauwenhoff	" "	X		"
Europe	" "	X		"
Edmée	rose	X		"
Baronne de la Tonnaye	"	X		"
Suzon	pale rose	X		"
Clara Butt	salmon pink	X	X	"
King Harold	crimson maroon	X		"
Geefs	deep bluish-lilac	X		
Ouida	vivid crimson red	X		
Bartigon	clear crimson red	X	X	"
Pride of Haarlem	cerise	X		"

WHAT TO DO WITH BULBS AFTER FORCING.

The same bulbs will not force the second time with any satisfaction, and as a rule will prove total failures. An exception, however, must be made for the Freesia, the bulb of which will be found fairly satisfactory for forcing again if ripened gradually. Most hardy bulbs need not, however, be thrown away if one has a garden. If the bulbs are ripened off gradually in the pots after forcing, by discontinuing watering and putting them where they will dry slowly, they may be planted in the autumn, and although the following year there will be little or no bloom, the year after they will usually bloom, especially Tulips and Narcissus. Bulbs which have been forced should not be planted in a prominent place, for sometimes they do not do well. Roman Hyacinths, Chinese Sacred Lily, and Paper White Narcissus, are tender bulbs, and will winter-kill if planted outside; hence, these should be thrown away after forcing.

NOTES.

MICE.

Bulbs are often injured in the cellar by mice, they being especially fond of the new shoots of Tulips. If mice prove troublesome, the pots of bulbs should be placed on a swinging shelf, unless the mice can be got rid of at once.

EARTH WORMS.

Some earth worms are usually in the soil used for potting bulbs, and get into the pots. If they prove troublesome during the winter, they may be easily destroyed by watering the bulbs with lime water, which may be made by putting a little lime—a few ounces being sufficient—into a pail of water, stir well, and when the particles of lime have settled, the lime water is ready for use.

APHIS.

Sometimes aphides, or green flies are troublesome on bulbs grown indoors. These can be destroyed by spraying the plants with tobacco water or whale oil soap, the latter in the proportion of 1 lb. to 8 gallons of water.

IRIS.

With a good assortment of iris one may have blooms of this lovely flower from early in May until late in July. There is a delightful little sweet scented species known as *Iris pumila* which begins to bloom about the middle of May, and this is followed in the latter part of May by Siberian Iris which is somewhat like the wild iris which grows about Ottawa, though taller,

then come the following which are among the best of the so-called German iris and bloom almost throughout the month of June.

Florentina large, white, faintly suffused with pale greyish-lavender, sweet scented.

Amas (Macrantha). Very large, standards mauve, falls deep purple.

Black Prince. Standards purple, falls very dark purple edged with a lighter shade.

Mrs. H. Darwin. Standards white, falls white reticulated with violet near base.

Victorine. Standards pure white blotched and edged with purple, falls dark velvety purple veined with white near base.

Fallida dalmatica. Standards and falls rich bluish-lavender.

Madame Chereau. Standards white deeply edged and reticulated with rich bluish-lavender, falls white edged with lavender.

Jacquiniana. Standards pale purple suffused with yellow near base, falls rich maroon veined with white near base.

Gracchus. Standards pale yellow, falls white veined with purple and edged with yellow.

Maori King. Standards golden yellow, falls deep maroon veined with white and edged with yellow.

Sappho. Standards deep bluish-purple, falls rich dark violet purple veined with white near base.

King of Iris.—Standards lemon yellow, falls brown with broad golden yellow border.

Mrs. G. Reuthe-Standards white shaded and veined with bluish-grey, falls white frilled with soft blue.

The Japanese iris bloom throughout July. They need more moisture than the German iris and should be planted in moist situations where possible, or, at least, kept well watered in dry weather. The rich colors of the Japanese iris are very suggestive of orchids. The nomenclature is rather mixed, hence, no list of names is given, but a range in color may be obtained by consulting lists in catalogues. All are very beautiful.

THE PAEONY.

Next to the rose, the paeony is, perhaps, the most popular garden flower in Canada and paeony enthusiasts would be tempted to place it before the queen of flowers. It is very easily grown which is one reason it is so popular. The paeony should be planted in full sunlight for best results, although a little shade at some time in the day is not a serious matter. The soil should be a deep, rich loam, but if it is not of this character, liberal manuring will prove very beneficial and in any case, annual applications of well rotted manure will be found desirable for best results. The best time for planting is in September or October. Plants should not be nearer than three feet apart

THE IRIS IS ONE OF THE VERY BEST FLOWERS FOR CITY GARDENS.

as although the pieces planted may be small they soon multiply and make large specimens which would be too crowded if planted closer together. When planted, the crown should be about two inches below the surface of the soil.

There are many varieties of paeonies, but in the following list of twenty-five, are included some of the best.

BEST TWENTY-FIVE PÆONIES.

Pure White:

Duchesse de Nemours (Calot)
Le Cygne
Marie Lemoine

White, edged or flecked with crimson or carmine; and flesh white:

Avalanche or Albâtre
Baroness Schroeder
Couronne d'Or
Festiva maxima
Marie Jacquin
Monsieur Dupont

Pale pink and pale pink fading to white, or edged with white:

Asa Gray
Eugène Verdier
Grandiflora (Richardson's)
Mademoiselle Léonie Calot
Marguerite Gérard
Triomphe de l'Exposition de Lille

Pink:

Claire Dubois
Livingstone
Madame Auguste Dessert
Madame Geissler
Modeste Guérin
Monsieur Jules Elie
Thérèse

Red

Felix Crousse

Dark Red:

Adolphe Rousseau
Monsieur Martin Cahusac

LILIES.

There are not as many lilies grown in the gardens of Ottawa as there should be. They are very beautiful and stately flowers and some, at least, should be found in every garden. Following is a list of twelve varieties which are recommended:

1. Lilium auratum. Gold-banded Lily. Japan. Half Hardy. Height 2 to 4 feet. Flowers white dotted with purple, yellow bands; mid July to September.

2. L. candidum. Bourbon Lily, Madonna Lily. South Europe, etc. Hardy. Height 3½ to 4½ feet. Flower white. July.

3. L. croceum. Orange Lily. South Europe. Hardy. Height 3 to 5 feet. Flower bright orange spotted with black. June.

4. L. elegans atrosanguineum. Hardy. Height 12 to 15 inches. Flower deep but vivid red. July.

5. L. elegans Wallacei. Hardy. Height 6 to 12 inches. Flower apricot-orange spotted with black. Middle of August to early September.

6. L. Henryi. Hardy. Height 4 to 6 feet. Flower deep orange yellow with a few brown spots. August to September.

7. L. longiflorum. China and Japan. Half Hardy. Height 2 to 3 feet. Flower white. Late July to early August.

8. L. speciosum and varieties. Half hardy. Height 2 to 3 feet. Flower white suffused and spotted with crimson. September.

9. L. superbum, American Turk's Cap Lily. Eastern United States and Western Ontario. Hardy. Height 4½ to 7 feet. Flower bright reddish-orange with dark spots; late June to middle of August.

10 L. tenuifolium. Siberian Coral Lily. Siberia. Hardy. Height 1 to 2 feet. Flower bright scarlet. June.

11. L. testaceum, Nankeen Lily. Garden origin. Syn. L. excelsum, Hort. Hardy. Height 4 to 6 feet. Flower buff or apricot color. July.

12. L. tigrinum splendens. Tiger Lily. China and Japan. Hardy. Height 3 to 5 feet. Flower deep orange spotted thickly with purplish-black. Late July to September.

PERENNIAL PHLOX.

The phlox is one of the most satisfactory hardy perennials, as the plants multiply rapidly, bloom freely, and make a great display in the border. To get the best results they should have an abundant supply of moisture and a damp situation should be chosen for them when possible. Their worst enemy is a tiny insect called the red spider, which, however, is not very troublesome except in dry seasons. Where the red spiders are abundant the leaves become yellowish where they are working and their presence may be known by these lighter patches. As they are feeding on the under side of the leaves any spray which is used must be applied there. To do this effectively, one person should hold back the foliage with a stick or rake handle and another do the spraying. Cold water frequently and forcibly applied will be found effective and any of the contact sprays such as nicotine sulphate, whale oil soap, or kerosene emulsion, will control it if used frequently. A little flowers of sulphur mixed with these will make them more effective.

There are many good varieties of perennial phlox, but in the following list will be found some of the best:

Antonin Mercié—Bright violet suffused with white, large white centre.

Consul H. Trost—Pure red with French purple centre.

SHIRLEY POPPIES AND HARDY LILIES.

Eclaireur—Bright rosy magenta shading lighter. One of the earliest.

Elizabeth Campbell—Salmon pink, shading lighter. A very pleasing color.

Etna, or Mounet Sully—Bright crimson red with darker centre. Both very good.

Wm Robinson—Salmon, large flowers.

Widar, or Lamartine—Bright violet with large white centre.

Panthéon—Crimson pink suffused with white about centre.

Pyramide, or Financée—Flowers pure white. Both very good.

Selma—Lilac rose with conspicuous crimson eye.

Europe—Pure white with crimson carmine centre.

Miss Lingard—White with a lilac centre, is an early free blooming variety which should be in every collection.

Tapis Blanc—One of the best whites. Dwarf.

George A. Strublein—Orange scarlet.

Mme. M. Carvalho—Mottled white and pink.

SWEET PEAS.

The Sweet Pea is the most popular annual grown at Ottawa. Its popularity is well merited for it possesses most of the qualities which are desirable in a flower—grace of form, delicacy and variety of colouring, a fragrance which is unsurpassed, long stem for cutting and a profusion and continuity of bloom from early summer until late autumn.

To obtain the best results the seed must be sown as soon after the snow is off the ground as possible, the reason undoubtedly being that the sweet pea requires moisture and coolness in order to develop a good root system, and a good root system means good plants and good flowers; therefore, where it is possible, a site for sweet peas should be chosen where the soil is naturally cool. A naturally cool soil is usually one where there is a constant supply of moisture during the summer months. No amount of surface watering can make up for the lack of a cool soil, although good results are obtained by artificial watering, even in dry, warm soils. While the soil should be cool and retentive of moisture, it should be well drained, as sweet peas, like most garden flowers, will not thrive in water-soaked ground. Sweet peas do not require as rich soil as is generally supposed. The sweet pea belongs to the family of plants known as the leguminosae, which are noted for the vigorous growth they make on land which is known as light soil—clover, beans and garden peas are all of this nature. They obtain much of their nitrogen from the air, hence highly nitrogenous soils are not necessary for sweet peas. We believe that an easily worked clay loam is the best kind of soil for sweet peas. It is usually a moist, cool soil and fairly rich in potash and phosphoric acid.

With the addition of well rotted barnyard manure thoroughly incorporated with it it should be sufficiently rich to grow very good sweet peas. Sweet peas are liable to run too much to vine if planted in clay loam and heavily manured; hence, as stated before, only moderate fertilizing is necessary or desirable. Good success has been obtained in growing sweet peas in light sandy loam soil with but a moderate dressing of manure, but if the season were a hot, dry one the results would not be so good. If there is no soil available except a sandy loam, the surface should be kept heavily mulched for 18 inches on each side of the row with lawn clippings during the summer, or, better still, with short manure, on top of which may be put the lawn clippings for cleanliness.

It should have been stated that of almost equal importance to a cool soil is abundance of sunlight. Sweet peas do not do well in shade and just in proportion to the amount of sunlight the plants receive so will be the success, all other things being equal.

As soon as the snow is off it is time to think of sowing the seed, and by the time the ground is dry enough not to puddle it should be sown. While abundant flowers will be obtained from the cheapest seed the size, form, purity, vigour and newest colours, which go with the best strains, amply reward the purchaser of the high grade, but slightly more expensive seed.

It is not known where the method of sowing, practised by many of the sweet pea growers in Ottawa originated, but it is believed that the method is not the best one for our climatic conditions. This method consists in opening a trench six inches deep where the sweet peas are to grow and sowing the peas in this trench. The seed is at first covered with two or three inches of soil, and as the plants grow the soil is gradually filled in until when the trench is filled level with the general surface of the soil the stem of the pea is buried six inches in the ground. It is not natural to deeply bury a plant which does not throw out roots from the stem. If we set a strawberry plant even an inch deeper than the crown it usually dies, and to bury the stems of sweet peas six inches deep seems to us most unnatural. The reason given for thus burying the stem is that the root will be well down where the soil is cool and moist. It is true they will be well down, but at how great a risk. If the season is a dry one and the soil rather loose there may be no injury, but if the season is a wet one, the buried stem becomes soft, disease attacks it, many plants wilt and die, and growers wonder what is the matter with their sweet peas. The injury will be found on the stem between the seed and the surface of the ground. This disease is usually worse with those who water frequently, which, in a fairly wet season, is quite unnecessary. Market gradeners know the conditions which favour the damping off of seedlings—lack of ventilation and excess of moisture and heat. Do you blame the

A PRIZE WINNING GARDEN AT 45 LEONARD AVENUE, OTTAWA.

sweet pea for becoming diseased when it is buried in such soil? The deep planting of sweet peas evidently originated in the warmer and drier States, where the surface soil is drier to a much greater depth than here. Under such conditions the stem of the sweet pea would remain hard and not be so subject to attack by disease, at the same time the roots of the plant are well down in comparatively cool, moist soil.

At Ottawa the soil is very cold when sweet pea seed is sown and while most seed seldom rots, the fact that the seed of white seeded varieties frequently rots shows that it is affected more or less by cold and wet. If the seed is sown very deep early in the spring it will be from two to three weeks before it appears, above ground.

Instead of the trench method we should recommend the following:—The soil having, if possible, been prepared in the autumn or in the spring, if fall preparation has been neglected, rake the surface smooth, leaving a slight depression towards the middle of the row just sufficient to cause the rain to flow towards the plants instead of away from them. Set a line along the middle of the row and open a trench about one inch deep, and not more than two inches deep. If the surface soil is loose, make it compact before opening the trench, unless it is a soil which becomes hard. Sow the peas fairly thickly, say about half an inch apart, not much thicker. Eventually the plants should stand about two inches apart, or even more for best results. Now cover the seed with soil and firm it over the peas with the hand. The surface soil being warmer, the seed will germinate quicker than at a greater depth and the young roots will soon seek the cool and moist depths of the soil. It is not necessary to plant deep to have the roots go deep, and by the time the hot weather comes they should be as far down as those planted according to the trench system, with much less danger of being injured by disease and the plants further ahead.

As soon as the peas are well up they should be staked or trellised. Wire netting is quite satisfactory and as it can be obtained much easier by city people than brush, it is most commonly used. Brush is unsightly, in our judgment, reminding one, for a long time before covered with the vines, of dead branches which should be removed. The trellis or brush should be at least six feet high, and if the soil is rich nine feet or more will be found necessary.

Sweet peas usually require little or no watering until they begin to bloom. In Ottawa where nearly every one has a hose and nozzle, and where holding these helps to keep one cool on a summer's night, too frequent watering is common with the result that the plants are made soft and when conditions are favourable disease attacks them, or in other cases where the ground is very rich they run too much to vine. When sweet peas begin to flower they need an abundant supply of water,

but it should be judiciously given. The farmer and market gardener cultivates his soil in order to conserve moisture and let air into the soil and he gets luxurious growth without any artificial watering. In many cases the keeping of the surface soil loose on each side of the row of sweet peas will conserve sufficient moisture until well on in thue summer without watering. Even when watering is done it is desirable to loosen the surface soil afterwards, as the roots of the plant require air as well as moisture. In order to keep the stem of the plant hard so that it may resist disease in the ground, we recommend watering in a trench about six inches away from the plants. The water soaks down, cooling and moistening the lower depths of the soil; but leaving the surface of the soil about the stems fairly dry. On some soils a very important assistance in the conservation of moisture and cooling of the soil is the mulch. This may be altogether of lawn clippings, or, better still, short, rotted manure over which are put lawn clippings. A mulch of this kind eighteen inches on each side of the row of sweet peas and two or three inches in depth will also prevent the surface soil from being tramped hard. While the mulch should come near the stems it should not actually come in close contact with them.

Returning to the subject of watering, it may be said that a thorough watering twice, or even once, a week is better than watering every day. It is scarcely necessary to say that no pods should be allowed to form if continuity of bloom is to be obtained. The peas should be cut every day or at most every other day. A difficulty most busy gardeners experience is to get the sweet peas kept cut as they should be. A short row kept well cut is more satisfactory than a long row neglected. One row twenty to twenty-five feet long will more than keep a household supplied with flowers and even ten feet would give an abundance of bloom, and from this length it is not too great an effort for anyone to keep the peas cut, even in the hottest weather. Peas should not be pulled from the vines; they should be cut off with as much of the stem as possible.

BEST VARIETIES OF SWEET PEAS.

Many varieties of sweet peas are introduced every year and a list of the best published this year may not include all the best varieties next year; but in the following list will be found those which have been the most satisfactory at Ottawa in recent years.

Colour	One of the Best of the Colour.	Other Choices of Same Colour
White	King White	Etta Dyke, Dorothy Eckford, Nora Unwin, Burpee White
Cream	Primrose Paradise	Mrs. Collier, Clara Curtis.
Chocolate or Purplish-Maroon	Nubian	Othello Spencer, Paradise Colossus, Black Knight.
Blue, and shades and tints of blue		
Light Blues	Princess Mary	Helen Pierce, Flora Norton Spencer, Paradise Celestial, Wedgewood, Zephyr, Empress Eugenie
Dark Blue	Lord Nelson	
Rose and Lavender	Tennant Spencer	Orchid, Asta Ohn, Irish Belle, Mrs. Walter Wright
Blush-Lavender	Florence Nightingale	Paradise Peacock, Moonstone
Red, and shades and tints of red		
Scarlet Crimson	King Edward Spencer	Maud Holmes, Dobbie Sunproof Crimson, Crimson Paradise
Scarlet	Scarlet Emperor	Queen Alexandra, Vermilion Brilliant
Ruby Red	Ruby Palmer	
Pink, and shades and tints of pink		
Light Pinks	Lady Evelyn Eyre	Martha Washington, Elsie Herbert, Mrs. Hardcastle Sykes, Prima Donna, Zarina, Duplex Spencer, Paradise Cherry Ripe.
Creamy Pinks	W. T. Hutchins	Ethel Roosevelt, Mrs. Routzan, Lilian, Paradise Ivory, Mrs. C. W. Breadmore, Mrs. Hugh Dickson, Helen Chetwynd Stapylton
Blush Pinks	Dainty	Charm, Agricola
Rosy Pinks	Margaret Atlee	Paradise Comet
Deep Rosy Pinks	Mrs. Cuthbertson	Jeannie Gordon, Constance Oliver, Hercules
Salmon and Orange Tints		
Salmon Pinks	Mrs. R. Hallam	Zarina Spencer, Janet Scott
Orange and Pinkish-Salmons	Helen Lewis	Edron Beauty, Stirling Stent, Barbara, Illuminator
Orange Scarlets	Thomas Stevenson	Saint George
Flakes Various Colours		
Pinkish-Salmon Flakes	Aurora	Miss Willmott, Mrs. W. J. Unwin
Pinkish-Cerise Flakes	Apple Blossom Spencer	Mrs. A. Ireland

Colour	One of the Best of the Colour	Other Choices of Same Colour
Maroon Red Flake	America Spencer	
Chocolate Brown Flake	Senator Spencer	
Various—		
Carmine Cerise	Cerise Spencer	Rosabelle, George Herbert, Prince of Wales, John Ingman.
Rose Carmine	Rose du Barri	
Pale Lavender Lilac	Moonstone	
Light Mauvish-Lavender	Charles Foster	

ANNUAL FLOWERS AND WHY THEY ARE POPULAR.

Flowers known as Annuals are flowers the life of which does not extend beyond one season, in contrast to perennials which live for a number of years.

This great class of annual flowers contain many well known and popular flowers. The names of such flowers as Sweet Pea, China Asters, Mignonette, Nasturtiums, Stocks are almost household words and that alone is proof that they are popular.

The three main reasons for this popularity are, the ease with which they may be grown, the cheapness of the seed and the long blooming season of so many of them. For instance, those mentioned above and a good many other annuals will continue to bloom for ten weeks to three months and few perennial flowers or shrubs can equal them in this regard.

All the energy of the annual flower is put into its short life; it does not seek to store up food for the next year as do perennial flowers, consequently its life, although short, is a gay one. From seed to seed in a period of about five short months is the life cycle of most annuals.

TYPICAL EXAMPLES OF ANNUALS.

The Sweet Pea is one of the most popular annuals and no doubt the best known. During the past fifteen years it has passed through a remarkable period and its development is typical of many annuals. There was a demand during the early years of this century for easily grown flowers suitable for the smallest as well as the most pretentious gardens. And it should be stated that annual flowers have done much in the past fifty years to make our towns and cities more beautiful and life a pleasanter thing. The Sweet Pea, China Asters, Pansies, and Ten-week Stocks hold very important places in that connection. Of Sweet Peas Keats wrote:

THE POPPIES ARE THE GORGEOUS FLOWERS OF JUNE.

"Here are Sweet Peas on tiptoe for a flight,
With wings of delicate blush o'er tipped with white;
And taper fingers catching at all things,
To bind them all about with tiny rings."

Very few, however, were grown in those days. Few colours were known, not half a dozen. Few people had much regard for them. Introduced from Sicily about 1700 it was not till 1870 that improvements were really made. A yellow variety was recorded in the catalogues of 1837 but if such was a true yellow it has since disappeared. A true yellow sweet pea would be worth, to its happy originator to-day, a good many thousands of dollars. In 1860 the first blue and first edged varieties appeared but it was not till 1870 that improvement in regard to the size, vigour, or substance of the flower took place.

The years 1901-02-03 were other very important dates in the life of the sweet pea for in these years the beautiful modern sweet peas known as the Spencers were introduced to the public. The Spencers are handsomer than most types owing to the fact that the "standard" is waved or frilled, the "standard" being the largest of the five petals or coloured parts of the flower. From those years on the popularity of the sweet pea increased so rapidly that a few years ago over fifty tons of sweet pea seed were sold in Great Britain alone in one year.

There is not space to give details regarding the development of any other popular flower but in several cases equally interesting development has taken place.

SOWING THE SEED.

To one who has had no practice in gardening effort the growing of a few simple annual flowers makes a successful start more assured and annuals are often the best flowers for the beginner.

In all districts which have weather conditions similar to those at Montreal, Ottawa, or north of Toronto, the best way to grow annuals with success is to sow the seed during the first two weeks in April. It should be sown either in the house, in a greenhouse, or in hot-beds. Good friable loamy soil and flower pots or shallow boxes for holding the same are all that is necessary in the way of material. Good seed should be used. Intelligent seed sowing, careful attention to proper watering and temperatures will invariably bring the best results. The seedlings will be strengthened and made more stocky if they are once transplanted before planting out into the garden, but this is not absolutely necessary.

Certain annuals will do best if the seed is sown directly into the place which they are to occupy in the garden. Most people know that flowers like the sweet pea, nasturtium, poppies, portulaca, and climbers like the Morning Glories, should be sown

direct and not transplanted. In such cases, if the soil is fit, the seed should be sown about the first week in May or before. Many people may not know, however, that such flowers as balsams, candytuft, cosmos, calliopsis, gaillardias, everlastings, linums, lupines, and petunias will do remarkably well when the seed is also sown directly into the garden.

ADVANTAGES OF GROWING ANNUALS.

Attention has been drawn to the fact that one reason for the popularity of annuals is that they are easy to grow, especially some of the very best sorts such as sweet peas and those just given in the lists. It must be pointed out in addition that annuals have several other advantages over all other flowers.

(1) Annual flowers may be used to fill up all the gaps in the perennial borders and to give bloom during those periods of the summer when few other flowers or shrubs are in season.

(2) Annuals may be used to produce bold effects by using large masses of them in strategic positions. For instance, petunias, verbenas, shirley poppies, salvia, snapdragons, will prove very effective when used in this way.

(3) For new gardens annuals are practically the only flowers which may be depended upon to give fine effects the first year inasmuch as perennial flowers and shrubs will not flower till the second and third years after planting.

(4) No other group of flowers is so rich in fragrant flowers as the annuals; "The perfume of tree and flower, of grace and mellow earth, is Nature's incense." The best known fragrant annuals are:

Sweet peas
Mignonettes
Ten Week Stocks
Nicotianas
Petunias, especially doubles
Candytuft
Pinks

(5) For cut flowers annuals give splendid rewards. The following is a representative list of annuals which give abundance of suitable blooms for cutting for decorative purposes.

ANNUALS FOR CUT FLOWERS.

China Asters
Sweet Peas
Nasturtiums
Sweet Sultan (Centaurea)
Pin Cushion Flowers (Sweet Scabious)
Single Collarette Dahlias
Ten Week Stocks
Mignonettes
Snapdragons
Everlastings
Zinnias
Calliopsis or Coreopsis

(6) The following annuals are among the most beautiful of all flowers:

China Asters
Salpiglossis
Sweet Peas
Godetias
Lavateras or Mallows
Shirley Poppies
Ten Week Stocks
Larkspurs, Tall varieties
Snapdragons
Verbenas
Petunias
Cosmos, Early flowering
Swan River Daisy

SOME OF THE BEST LOW-GROWING ANNUALS.

California Poppies
Candytuft
Mignonette
Pansies
Petunias
Portulaca
Pinks, Annual
Phlox, Drummond's
Verbenas

SOME OF THE BEST ANNUAL FLOWERS OF MEDIUM HEIGHT.

Acrocliniums or Everlastings
Balsams
China Asters
Coreopsis
Clarkias
Gaillardia, Annual
Godetias
Larkspurs, Annual
Love-in-a-mist
Marigolds, (Tagetes)
Marigold, Pot, (Calendula)
Nemesias
Pin-Cushion Flower
Poppies
Stocks, Ten-Weeks
Scarlet Sage
Snap-Dragons
Sweet Sultans
Zinnias

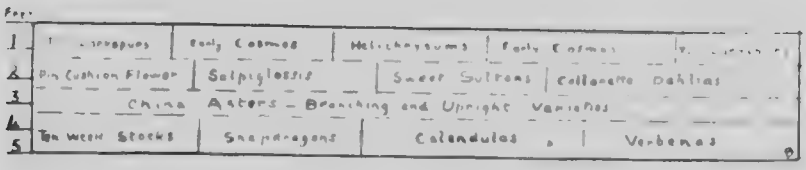
SOME OF THE BEST TALL-GROWING ANNUALS.

Cosmos
Everlastings
Larkspurs, Annual
Painted Tube-Tongue
Sunflowers
Tobacco Plant

SOME OF THE BEST CLIMBING ANNUALS.

Morning Glories
Nasturtiums, Climbing
Sweet Peas
Eccremocarpus, scaber
Cup and Saucer Vine, (Cobaea scandens)
Canary-Bird Vine, (Tropaeolum canariense)

For fuller information on the habits of these flowers see C.E.F. Report for 1914, page 529.



A BORDER FOR ANNUAL FLOWERS 5 X 35 FEET

THE CULTIVATION OF ROSES.

SITE AND SOIL.

The rose requires an abundance of sunlight for best results, and, where possible, a site should be chosen where the plants will be in the sunshine most of the day. If this is not practicable, the next best site is one where the bed will get the morning sun but will not be in such a position that the heat of the midday or afternoon sun will be reflected from some wall or building, for in this burning heat both flowers and plants will suffer. South or southeastern exposures are desirable. As roses need an abundance of moisture, the bed or garden should not be within reach of the roots of trees which would exhaust the soil of much moisture and plant food as well. Just in proportion to the tenderness of roses from the standpoint of winter, so is the relative care in the selection of soil for the rose plantation necessary. Roses of the hardiest group will do well on a great variety of soils; roses of the other groups are more fastidious, for while the Hybrid Perpetuals succeed best in a cool but well-drained clay loam, the Tea roses should have a warmer soil, a sandy loam being preferable. However, where it is possible to do so, an intermediate type of soil may be chosen which will suit all the groups. In England, roses succeed much better than at Ottawa, the moister air and cooler soil suiting them better than the dry air and hot soil which they are liable to endure here. A soil, then, should be chosen which is naturally cool, and cool soils are usually those with considerable humus and having a good capacity for holding moisture. Clay loams are usually naturally richer than sandy loams, and as the rose requires a liberal amount of plant food the heavier soils have an advantage in this respect also. Shallow soils should not be chosen for roses, as these are liable to become very dry and warm during a drought, making conditions unfavourable.

Soils where water lies within three feet of the surface should not be chosen, as such soils are cold, and roses will not bloom well in them. Often roses in such soils will make strong growth and

will not bloom, puzzling the grower. The soil should be cool, but well drained, deep and rich, and if it is not this naturally and there is no choice of sites it should be made as nearly like this as possible. Even soils of good quality naturally should be well enriched with well-rotted barnyard manure before the roses are planted, working it well down and through the soil. In order to make a good bed for roses where the soil is not naturally deep and where there is poor drainage, first remove the good soil from the surface, then remore the lower soil so that about two feet in depth of soil is removed altogether. Then if the soil needs drainage, lay three-inch tile on the bottom with sufficient fall to carry the surplus water away, having, of course, some outlet for it. If this tile draining is not practicable, some gravel or small stones below the two feet of soil will help to drain it. Put good surface soil from somewhere else, preferably with some clay in it, on the bottom, spread a heavy coat of rotted manure on it and dig it in. Then put back the surface soil which has been removed from the bed, or better soil if it is poor, and again dig manure into this. This should make a good bed for roses. The soil should be allowed to settle for a month before the roses are planted, for best results. The kind of preparation of the soil outlined above, while ensuring good results, is not usually necessary, and no person, should be deterred from growing roses because of the careful preparation recommended. Roses may be planted in almost any good loamy soil, with fair results, provided the soil is neither very wet not very dry.

PLANTS AND PLANTING.

Strong, two-year-old budded plants are the best to plant. Yearling plants, while cheaper, do not make much show the first year, and one is liable to be discouraged before the next season comes round. Some roses do very well on their own roots, while others are not very vigorous. On the whole, budded plants are the best. The autumn is the best time to plant roses, preferably just before winter sets in. Sometimes, however, roses though ordered for autumn delivery do not reach one in time, in which case a good plan is to heel them in, in unfrozen soil by digging away the frozen soil and burying the roots and a large portion of the stems. The novice in rose culture is, however, more likely to obtain his roses in the spring, and it is for this reason that so many failures occur. By the time the plants reach their destination they have often begun to wither, and when planted in this condition are almost sure to die. Conditions are made much worse when the plants come in May when the weather may be hot and the winds and soil dry. Tea roses should be planted about fifteen inches apart; Hybrid Teas about eighteen inches; Hybrid Perpetuals two and a half feet, and the Rugosa hybrids, Moss roses and other hardy sorts about four feet. If the roses are planted in the autumn they should not be pruned back at

that time, but left until spring. If, however, they are planted in the spring it is necessary to prune back severely when planted. The bushes should be planted deep enough so that the point of union between stock and scion is from two to three inches below the surface of the ground. This is important as if the union is at or near the surface, the sun shining on it hardens the wood and prevents a free circulation of sap, which is not desirable, as for best results a strong, vigorous growth is necessary. When planting, the soil should be well tramped about the bush to bring the particles into close contact with the roots and ensure their getting moisture as soon as possible. Roses have comparatively few roots, and none of these should be pruned off when planting, unless there should happen to be a very long root preventing proper planting, when its length may be reduced, or if there are broken roots they should be removed. The roots should not be exposed to drying winds, when planting, any longer than is absolutely necessary. A plan sometimes followed is to dip the roots in a puddle made of clay and water. This coating of clay on the roots not only protects the roots when the bushes are being planted, but we believe ensures a quicker flow of moisture to the roots in the soil. If the stems look withered when they are received, the plants should be buried for about two days in wet soil so that the stems may take up water from the soil. This will often save plants which would otherwise die. In addition to this it is desirable if the weather is very dry at planting time, to heap the soil up around the stems until there is rain. When the plants are set in the autumn the soil should be heaped up around the stems to protect them. In the spring this is removed and the plants severely headed back. One should not hesitate to reduce the stems so that there will be only from three to six buds left on each of the stems above the ground This severe pruning is even more important in the case of spring-set plants, and is often the means of saving the plants which would otherwise die.

CULTIVATION AND WATERING.

As has been stated before, roses need an abundance of moisture. By keeping the surface soil loose from spring until autumn much moisture which would otherwise pass off into the air will be held in the soil. After each rain the surface should be hoed and raked, leaving a rather coarse surface, or during a dry time, if it has been necessary to water the roses, the soil should be loosened after watering. It is better to water roses thoroughly, occasionally, than to give them a light watering frequently. It is not, however, too often to syringe or spray the foliage with water every day, as this is one of the best preventives of insects. This syringing is, however, for the purpose of cleansing the foliage, not for adding moisture to the soil. This spraying should be done in the evening, or early in the morning

as if the foliage is wet in the middle of a hot, dry day it is liable to scald.

MANURING.

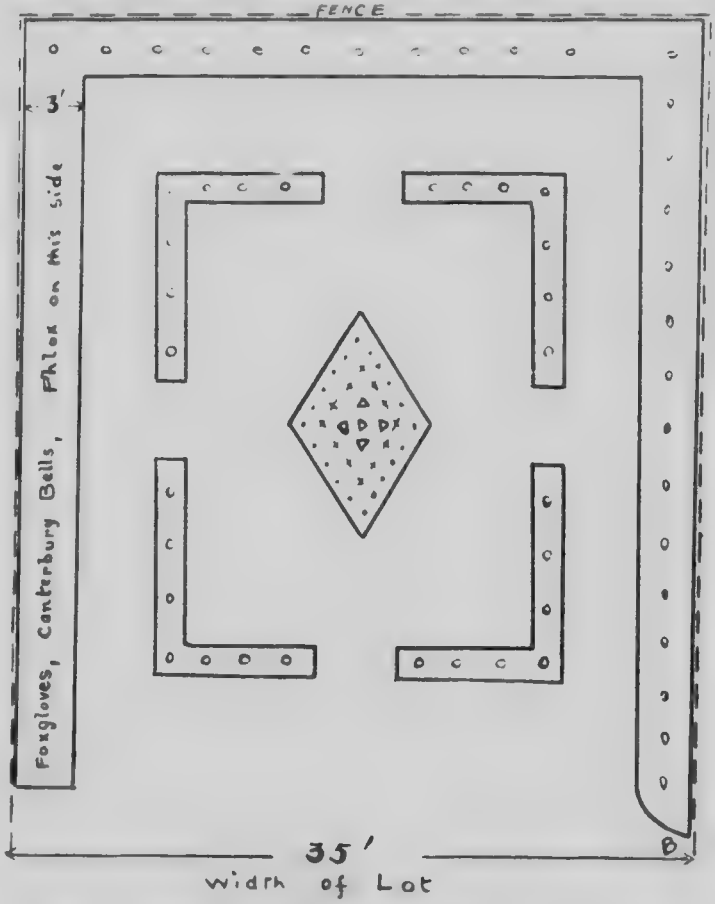
Soils should be kept rich and well supplied with humus by the annual application of well-rotted barnyard manure in large quantities. This may be applied on the surface of the ground in the autumn and dug in in the spring, or applied in the spring.

PRUNING.

The pruning of roses will vary according to the kind and even the variety of roses which is to be pruned. Roses of the hardiest group nearly all bloom on wood of the previous season's growth or wood several years old, and as these roses are grown mainly for the mass effect of their flowers rather than the excellence of the individual flower, they should be pruned so as to produce this mass effect. If, then, they are pruned back to near the ground there will be few roses. If the branches and stems are left their full length or merely headed back a little to make the bush symmetrical there will be a fine mass of roses. In addition to this it is necessary to remove some of the oldest wood each year, cutting the branches out at the ground, thus making room and letting in light so that the younger stems will develop well. As the stems one and two years old are those which give the best flowers, there should be a large proportion of these. Dead branches should, of course, be removed.

Most of the roses in the second group must be pruned differently, although the climbing roses may be treated somewhat as has been recommended for the first group, with the exception that, where it is desired to cover a wall with a large rose bush, the old canes must be left to a greater age so as to provide for lateral branches. The Hybrid Perpetual roses give the best results so far as quality of bloom is concerned under hard pruning. To obtain the finest flowers one must relentlessly cut back the bushes each spring to within six to twelve inches of the ground. If, however, a mass effect is desired the bushes may be left taller, and where the conditions of soil are exceptionally good, bushes which have not been pruned back severely will give a large number of fine blooms. Experience will soon teach what is the best method of pruning for particular conditions or desires. The stronger varieties do not require as severe pruning as the less vigorous, and sometimes very few blooms are obtained when a very vigorous variety is cut back to near the ground, as the very strong growth which follows is without bloom. It is better to prune early in the spring rather than in the autumn, as one never knows how a plant will come through the winter. In pruning, the strongest, healthiest stems are left and the weak ones cut off at the ground. In pruning, leave an outside rather than an inside bud as the top bud, so that the shoot from this bud grows outward rather than through the plant.

Hybrid Tea roses are pruned much like Hybrid Perpetuals though usually not so severely. Tea roses, which usually kill to near the ground at Ottawa, if they live through the winter at all, should have the dead and injured wood removed, and if the wood should not be injured the branches should be pruned back about one-third. It is extremely important to remove suckers or roots springing from the stock on which the rose is budded. These should be removed as soon as noticed and careful watch kept for them. They should be cut off close to the stock and not at or above the ground. It may be necessary to



PLAN OF A SMALL FORMAL ROSE GARDEN IN A BACKYARD

at 163 Fifth Avenue, Ottawa.

The diamond shaped bed contains cannas, coleus, and geraniums. The roses are also interplanted with pansies and other low growing flowers.

take away a little soil to do this. There is no reliable way of telling the stock, although experience will increase the knowledge in this respect, but viligance is necessary or the stock will assert itself and soon the rose one thinks he is growing will not be there. The leaves of the stock are often of a paler green colour than the named varieties, and not so glossy. Sometimes the leaves of the stock have a purplish tinge. Usually the stocks have a larger number of leaflets on the leaves than the named varieties.

WINTER PROTECTION

Roses of the first group need no protection at Ottawa except that the Rugosa Hybrid, Conrad F. Meyer should be protected somewhat by bending down the canes. For Hybrid Perpetual, Hybrid Tea, and Tea roses protection is necessary. One of the simplest methods of protecting both Hybrid Perpetual and Hybrid Tea roses is to earth them up six or eight inches or more in the autumn, thus protecting the lower part of the stems, and if the tops are killed back the lower part of the stem is almost sure to remain alive. In addition to this the plant may be bent down and held down with soil, or where bushes are not usually pruned back severely they may be entirely covered with soil to preserve them. A light covering of straw or evergreen boughs over the soil is desirable in exposed places, which will prevent sudden thawing and freezing and may save the plants sometimes. If the soil is frozen deep before one thinks of covering, the bush may be bent down and held down with boards and covered with evergreen boughs, or even without these the snow may be sufficient protection. In the spring the soil should be levelled and the bushes raised as soon as possible to prevent the development of disease. Good results are obtained where the preceding method fails by bending the bushes down and covering them with a box, and still further protection is afforded by bending down, putting a box without cover or bottom over, then filling this with dry leaves and putting a cover on the box, which should be tight. If the leaves are wet when put in or if they become wet in the spring the stems may mould. When boxes are used the cover should be raised at the first opportunity in the spring to allow a freer circulation of air and permit the stems to dry and the bark harden a little before removing the box altogether.

Climbing roses should be taken down, the branches tied together and put in a long, narrow box, and treated as described if it is found necessary. Or, where there is usually a good covering of snow they may be bent down and partly, or entirely, covered with soil or covered with evergreen boughs as for dwarf roses. Tea roses are the most tender and they should be earthed up as described for Hybrid Perpetuals and Hybrid Teas, and in addition, for best results, covered with a box filled with dry leaves as described.

Good foliage is essential to the production of good roses, and, moreover, good foliage is desirable in a rose garden because of its appearance. Leaves badly curled, mildewed, spotted, or eaten, take away very much from the attractive appearance of a rose garden. The easiest insect to control is the Rose Slug, a green caterpillar which does not usually appear in great numbers but which works on the underside of the leaves and eats out pieces. These may be picked off by hand where bushes are few, but Paris green or hellebore sprayed on the bush so that it will reach the undersides of the leaves especially will quickly kill them. If Paris green is used it should be used weak so as not to burn the foliage, or about in the proportion of one ounce to twelve gallons of water. Hellebore is used in the proportion of one ounce to two gallons of water.

The aphis or green fly is sometimes quite troublesome, and the thrips, small, hopping insects which cause the leaves to curl, often do much harm unless controlled. There are several good remedies for these, and, as prevention is better than cure, a remedy should be applied before the insects have increased in numbers. As stated before, thorough spraying with water is a good preventive but some other spray material is usually necessary. Among such are nicotine in the proportion of one teaspoonful to one gallon of water, or a decoction made of quassia chips and soft soap or whale oil soap made by boiling four ounces of quassia chips for ten minutes in a gallon of soft water, then strain and, while the liquid is still warm, dissolve four ounces of soft soap or whale oil soap in it, and before using add one gallon of water. It may be necessary to syringe with water, after the insects are killed, to clean the plants. Whale oil soap in the proportion of one pound to six gallons of water is a good insecticide to use for aphis or thrips, and kerosene emulsion is a reliable remedy, but is improperly made the foliage may be injured. Nicotine sulphate is also good.

The same remedies may be used for Red Spiders, tiny insects the presence of which is indicated by a yellowing of the leaves. These insects work on the underside of the leaves and unless the eyesight is good cannot be detected with the naked eye. Thorough and frequent syringing of the underside of the leaves with water alone will help to keep these insects under control, and flowers of sulphur mixed with kerosene emulsion or whale oil soap will make these insecticides more effective.

Where the Powdery Mildew is troublesome it may be controlled by sprinkling the bushes every ten or twelve days with flowers of sulphur until the disease disappears. The Leaf Blotch or Black Spot is another disease which sometimes disfigures the leaves very much and weakens the plant. Bordeaux mixture and Ammeniacal Copper Carbonate Solution will control

this, but if the former is used it should be used several weeks before the blooming season or after it, so that the foliage will not be disfigured by the spraying material when the roses are in bloom. Ammoniacal Copper Carbonate is made with one ounce copper carbonate, four-fifths of a pint of ammonia and eight gallons of water. Dissolve the copper carbonate in the ammonia. The ammonia and concentrated solution should be kept in glass or stone jars tightly corked. When the disease is in a plantation, every effort should be made by thorough spraying to control and destroy it as soon as possible. Plants should be sprayed about once a week after the disease is first noticed and where it has occurred previously, begin as soon as the foliage is out.

BEST VARIETIES OF ROSES FOR OTTAWA

HYBRID PERPETUAL ROSES

Frau Karl Druschki, H.P.—Up to the present this is acknowledged to be the finest white rose in cultivation. The plant is a strong and healthy grower and makes abundance of bloom throughout most of the season. The long pointed buds are pink on the outside but open to pure snow-white flowers of large size and beautiful form. Other white varieties of more recent origin are Ethel Malcolm 1910, and British Queen 1912. A good white rose should occupy a place in every collection.

Hugh Dickson, H.P.—This is one of the very best of its class. The plant is vigorous and a free bloomer. The clour of the flower is attractive and lasting, being crimson, shaded scarlet. Highly recommended. Does well at Ottawa, and in town gardens generally.

Mrs. John Laing, H.P.—Another deservedly popular rose, and a winner of the Gold Medal. Plant a free and vigorous grower, producing a good number of blossoms in the spring and again in the autumn. Flowers rosy-pink, good size, and lasting in quality. Fragrant. Does well in town gardens.

Mrs. R. G. Sharman-Crawford, H.P.—This is one of the best of its class for a second crop of blooms. The plant is of fair growth and healthy. The flowers are a beautiful shade of clear rosy-pink, and of moderate size. A variety easy to grow.

Ulrich Brunner, H.P.—This rose forms one of the three recommended by one of the most noted of rosarians as the three best "Roses for Cottage Gardens." The plant is vigorous and does well at Ottawa. Although it does not blossom freely it gives some autumn bloom. Flowers cherry-red, fragrant, and of good size.

General Jacqueminot, H.P.—This is one of the oldest of its class which still lives up to its reputation. The plant makes vigorous growth and gives abundance of blooms. The colour is bright scarlet crimson, which in hot weather fades to a purplish-red. Fragrant.

NITHE ROSE GARDEN AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA.

Her Majesty, H.P. This is a rose which has done very well at Ottawa, and is included in the collection because of its type. The plant is vigorous and upright, and produces, when established beautiful large-sized pink blossoms. It does well in a hot season, but does not give much autumn bloom. It won the N.R.S. Gold Medal by acclamation when introduced in 1885.

Other excellent hybrid perpetual roses are Charles Lefebvre velvety crimson, fragrant; Capt. Hayward, scarlet crimson, fragrant; Margaret Dickson, white with pale flesh centre, fragrant; Clio, flesh color shaded with rosy pink; Magna Charta, bright rose.

HYBRID TEA ROSES.

Caroline Testout, H.T.—Since its introduction in 1890 this has been a very popular rose in its class. The plant makes good growth. The flowers are bright warm pink in colour, and fairly lasting. It is a free blooming variety and reliable. Good for town gardens.

Dean Hole, H.T.—At Ottawa during the past few years this has been the one rose which has been unequelled for its abundant and continuous blooming habit. The plant is vigorous and healthy. The flowers are pale silvery-rose, deeper shaded. It appears to be as hardy as most of the H.P. roses, and is perhaps the best of all roses for autumn bloom. This rose, with several others possessing many good habits and the ability to withstand our winters, augurs well for the future of roses of this class in districts even as cold as Ottawa. Slightly fragrant.

Ecarlate, H.T.—This rose is of comparatively recent introduction and has succeeded well at Ottawa and elsewhere. It is given a place here because, in addition to its ordinary merits, it is of a strikingly bright scarlet colour and free blooming. Bright red roses are not common amongst the Hybrid Teas. This is most effective planted next to varieties like Madame Ravary or Joseph Hill.

Gustave Grunerwald, H.T.—A rose succeeding well at Ottawa and giving general satisfaction elsewhere. Fairly vigorous, free flowering, and a bedding rose of excellence. Flowers fairly large bright carmine, with yellow centre. Blooms well early and late in the season.

Lady Ashtown, H.T.—One of the most satisfactory roses of recent introduction. Easy to grow and a very persistent bloomer, giving nice long pointed buds, with deep pink flowers of good substance. At Ottawa it gives promise of taking a place near the top of list of the best dozen of its class.

Lady Ursula, H.T.—A plant of fairly vigorous habit. The flowers are large, full, and of good shape; flesh pink in colour, and fragrant. It is a good all-round rose of great promise; but owes its place in this list more particularly to the fact that as an autumn bloomer it is almost equal to Dean Hole.

Madame Ravary, H.T.—No list of good Hybrid Tea roses would be co[illegible]t if it did not contain one of the fine yellow varieties wh[illegible]re the glories of the class. It would be a difficult poin[illegible]ssign its place on the score of colour alone to this rose, as [illegible]rs Aaron Ward, La Progres, Margaret Molyneux, Joseph Hill, and others are equally beautiful perhaps, but Madame Ravary has done well at Ottawa in the vigour of its growth and abundance of bloom. It has beautiful golden yellow buds opening to orange yellow, and is a good town rose.

CLIMBING ROSES.

Crimson Rambler—Crimson, double. The most satisfactory climbing rose.

Dorothy Perkins—Soft, light pink.

Tausendschon—Pink, rosy-carmine.

DWARF, POLYANTHA—POMPON ROSES.

Orleans Rose—vivid crimson; free blooming; Mrs. W. H. Cutbush—Bright deep pink; free blooming; Phyllis—Bright carmine pink, free blooming; Katharine Zeimet—Pure white; free blooming. These are fine for borders or for edging.

OTHER (HARDIEST VARIETIES) ROSES.

Madame Plantier—White. A very hardy hybrid perpetual. Flowers rather small.

Persian Yellow. A hardy double, yellow rose.

Crested Moss—Pale rose. Buds prominently crested.

Old English Pink Moss—Pale rose; well shaped buds.

Rosa rugosa Conrad F. Meyer—Clear silvery-rose; double; fragrant.

Rosa rugosa Mad. Chas Worth—Rosy-carmine; semi-double. Very hardy.

Rosa rugosa Mad. Georges Bruant—White; double. Very hardy.

Rosa rugosa Blanc Double de Coubert—White; double Very hardy.

ORNAMENTAL TREES AND SHRUBS.

SOME REASONS FOR GROWING ORNAMENTAL TREES AND SHRUBS.

A beautiful tree is one of the most beautiful things in all God's creation.

Trees around the home give pleasant shade, and on hot days, moderate excessive temperatures by means of transpiration.

Trees around the home make pleasant contrast with the

straight architectural line of the house, and often add an unconscious charm to the home.

Trees around the house break the force of windstorms, and often protect it from injury.

Shrubs may be grouped into picturesque masses, may be used to screen unsightly buildings, or planted to soften harsh boundary lines.

Shrubs are ornaments in the out-of-door room, which lasts for many years, and receiving a little attention, grow into a beauty of perfect form and fitness.

Shrubs are beautiful and oftimes fragrant in time of flowers, clean and attractive in foliage, and their fruits are often the winter food for our bird friends.

The cost of a tree or shrub spread over the long years of its life, during which it ministers to our higher senses and love of the beautiful, is often less than the cost of one meal.

The worth of trees and shrubs is the worth of subtle influences, directing life's motives into channels leading from the brute towards the Creator.

GOOD STREET OR AVENUE TREES

American Elm (*Ulmus americana*). The best of the larger quick-growing hardy trees for wide streets or avenues.

Maple, Sugar, or Rock Maple (*Acer saccharum*). One of the best known, popular and most useful trees for street planting.

Maple, Norway (*Acer platanoides*). This maple does not grow so large as the sugar maple, but forms a round-headed symmetrical tree, hardy and attractive. It does not make as good a trunk as the Sugar maple. The leaves turn yellow in the autumn, not red like the Sugar maple.

Oak, Red or Scarlet (*Quercus rubra and coccinea*).—The oaks, although of slightly slower growth, make good avenue or street trees. The red and scarlet are the best.

Basswood, or Linden (*Tilia americana*). -The Basswood makes a useful tree for either avenues or streets.

ADDITIONAL TREES USEFUL FOR STREET OR AVENUE PLANTING.

Green Ash (*Fraxinus pennsylvanica lanceolata* [illegible]).
Red maple (*Acer rubrum*).
Pin oak (*Quercus palustris*).
Maiden-hair tree (*Ginkgo biloba*).
White ash (*Fraxinus americana*).

GOOD TREES FOR SHADE AND ORNAMENT AROUND THE HOME.

Purple-leaved Norway Maple. Produces handsome purple leaves in spring and summer.

Wier's Cut-leaved Silver Maple. A very beautiful weeping tree.

Western or Japanese Catalpa.—Big handsome leaves, and attractive flowers.

Cucumber Tree.- Big broad leaves, and curious fruit.

Kentucky Coffee Tree. A rugged looking tree with beautiful leaves.

American Larch, or Tamarack. Graceful and attractive, pleasing green colour.

Rowan Tree, or Mountain Ash.—Noted for its handsome fruit and pretty leaves.

Laurel-leaved Willow. - A handsome tree with glossy leaves.

BEST SMALL TREES FOR INDIVIDUAL PLANTING.

Siberian Pea Tree. -Yellow pea-like flowers.

Japanese Lilac. -Beautiful white panicles early in July

Flowering Crab Apples. Very beautiful in spring.

Western Catalpa. Fairly hardy, very attractive

Russian Olive. Silver foliage, rapid grower.

Ginnalin Maple. Deeply cut, attractive leaves, bright red in autumn.

Cockspur Thorn. Flowers pretty and foliage good.

SOME GOOD EVERGREENS.

White Spruce. Several planted together make handsome groups.

Norway Spruce. Individual trees with their drooping branches are very effective.

Koster's Mountain Blue Spruce. -Koster's blue spruce is the best. This tree, at all stages of its growth, is wonderfully attractive and striking

Pyramidal Arbor-Vitæ or Cedar.—Without pruning it grows to a tall pyramidal of column-like tree.

Douglas' Golden Arbor-Vitæ or Cedar.—This variety is attractive because of its colour, bright green tipped with gold.

Globe Shaped Arbor-Vitæ. -Its natural shape is globular, produces a good effect when grown in a right setting.

Siberian Arbor-Vitæ. The hardiest form and a very attractive variety.

Savin Juniper.- A low-growing evergreen very suitable for covering banks or rocks

Dwarf Mountain Pine.—A dwarf or shrubby species which makes a good lawn specimen.

White Pine.—The best hardy pine for ornamental purposes.

Japanese Yew.—The only hardy yew at Ottawa.

TREES NOT RECOMMENDED, ALTHOUGH OFTEN PLANTED.

Horse Chestnut. Subject of late years to a fungous disease and not perfectly hardy at Ottawa

Cut-leaved White Birch.—A beautiful tree, but subject to the attacks of a borer, generally proves fatal.

Silver Maple.—Subject to severe damage from wind, owing to its soft, brittle wood.

Black or Yellow Locust.—Subject to the attacks of a borer, which proves fatal.

SOME OF THE BEST HARDY ORNAMENTAL SHRUBS.

Berberis Thunbergii.—Thunberg's barberry (Japan). Height, 2 to 4 feet. The best barberry for ornamental purposes. It is a dwarf, compact shrub, with bright, green leaves in summer, changing in autumn to deep red. The flowers while not very striking are attractive. The scarlet fruit is borne very profusely and makes this barberry quite ornamental throughout the winter.

Caragana grandiflora.—Large flowered Caragana. (Caucasus). Height, 4 feet. In bloom third week of May. Flowers large, bright yellow, pea-shaped. Very pretty when in full bloom. This somewhat resembles *C. frutescens*, but has larger flowers. The bush is somewhat pendulous which makes it rather graceful.

Hydrangea paniculata grandiflora.—Large flowered hydrangea (Japan). Height, 6 to 10 feet. Blooms remain attractive from August until October. Flowers white gradually becoming pink and borne in very large panicles. This is one of the finest hardy shrubs. To get best results the bushes should be pruned back severely every spring and given an abundant supply of water during the growing season.

Hydrangea arborescens grandiflora. (United States). Height 4 to 6 feet. A very free blooming variety with large panicles of white flowers which come in succession from July to September. The bush kills back each year but it is sufficiently hardy to ensure abundant bloom.

Lonicera tatarica.—Tartarican honeysuckle, bush honeysuckle (Siberia, Tartary). Height 5 to 10 feet. In bloom third week in May. Flowers bright pink. This is an old favourite and one of the hardiest shrubs grown. There are many varieties of this fine shrub and a large number of hybrids. These vary in colour of flowers from white to rose. Some of them have yellow coloured fruit. Among the best are:—*L. tatarica pulcherrima* with rosy petals, having pink margins; *L. tatarica gracilis*, flowers rosy in bud, pink and rose when open; *L. tatarica speciosa*, flowers large, pink and rose; *L. tatarica splendens*, flowers pink in bud, pink and white when open; *L. tatarica grandiflora rubra*, flowers rosy in bud, rosy with pink margin when open; *L. tatarica elegans*, flowers pure white; *L. tatarica alba grandiflora*, flower white.

Philadelphus coronarius.—Mock orange or Syringa (South Europe). Height, 5 to 10 feet. In bloom second week of June.

Flowers, white, with a strong, sweet odour. A well known, popular shrub. In addition to this species there is *Philadelphus grandiflorus*, a taller and later blooming species, *P. grandiflorus speciosissimus* and many fine hybrid varieties among the best of which are Boquet Blanc, Nuée Blanche, Voie Lactee.

Ribes aureum.- Missouri currant (United States). Height, 6 to 8 feet. In bloom, fourth week of May. Flowers, yellow and very sweet scented. This currant is quite ornamental, especially when in bloom, and again in summer the fruit, which is quite palatable, makes it attractive at that time.

Rosa rugosa.—Japanese rose (Japan). Height, 4 to 5 feet. In bloom, second week of June. Flowers, very large and deep pink. This is a beautiful rose with fine flowers and very ornamental leaves which are large, thick and shiny. There is a white-flowered variety which is also good, also a number of hybrids between rugosa and varieties of hybrid perpetual and tea roses, most of which are quite hardy.

Spiraea arguta.—Europe. Height, 3 to 4 feet. In bloom 3rd week of May. Flowers pure white, produced very profusely in compact clusters. This is the earliest flowering spiraea grown here, and is one of the best hardy shrubs of recent introduction. It is a graceful little spiraea with pendulous branches, but its chief beauty lies in the abundance of its pure-white flowers.

Spiraea Van Houttei. Van Houtte's spiraea (Europe). Height 3 to 5 feet. In bloom first week of June. Flowers pure white, borne very profusely in small, compact clusters on pendulous branches. This graceful shrub is very beautiful when in full bloom. Even when out of bloom its pendulous habit and foliage make it attractive.

Syringa villosa.—Chinese lilac (North China). This is also a strong growing lilac and is growing taller than at first expected, some specimens being now from 6 to 8 feet high. The leaves are rough and rather coarse looking, but this tends to make the shrub more striking. It flowers during the second week of June, closely following S. Josikaea. It is a free bloomer and the flowers, which are not highly perfumed, are bluish-pink and produced in good sized panicles. This is a very desirable species.

Syringa vulgaris.- Common lilac (Eastern Europe). The common lilac and its varieties bloom during the last half of May, being usually at their best from the 20th to the 27th. There are many fine varieties of the lilac varying in color from white to the deepest purple. Some are single and some semi-double or double. Among the best are the following:- Single-Alba Grandiflora (white), Aline Mocqueris (purplish-mauve, brighter in bud), Charles X (purplish-mauve, fading lighter), Congo (purplish-mauve, one of the deepest shades), Delepin (bluish), Jacques Calot (purplish-mauve in bud, violet mauve when opened, flowers large), Lovaniensis (almost pink), Toussaint-Louverture

(bishop's violet, almost purple. One of the darkest in color. Double Charles Joly (vinous mauve, with twisted petals), Comte de Kerchove (purplish-mauve changing to lighter shades), Emile Lemoine (purplish-mauve changing to heliotrope), Georges Bellair (purplish-mauve, petals tipped with white), Jean Bart (purplish-mauve to violet mauve, flowers with twisted petals), Madame Abel Chatenay (white), Madame Casimir Perier (white), Marc Micheli (violet mauve changing to heliotrope and white, flowers large), Michel Buchner (violet mauve to bluish-violet), and many others almost or quite as fine.

Viburnum Lantana.—Way-faring tree (Europe). Height, 8 to 12 feet. In bloom third week of May. Flowers white in compact flat heads. The fruit is very ornamental, being scarlet, turning to dark purple when ripe.

Viburnum Opulus. Guelder rose, high bush cranberry (Canada). Height, 6 to 8 feet. In bloom second week of June. Flowers, white, in large clusters. This is, at all seasons of the year, an ornamental shrub, as the abundant bright scarlet fruit remains on the bush all winter.

Viburnum Opulus sterile.—Snowball. Height 8 to 10 feet. In bloom second week of June. The almost round clusters of pure white flowers of this shrub are well known. This is one of the most ornamental hardy flowering shrubs, but during the past few years it has been badly attacked by aphis. To destroy these it is necessary to spray the bushes just as the buds are breaking in the spring. This is very important as at this time the eggs are hatching. A second spraying should be given in a few days, and while the leaves are still only partly expanded. Once the insects cause the leaves to curl it is almost impossible to get at them. Kerosene emulsion, whale oil soap or nicotine preparations may be used for spraying.

SOME GOOD WOODY CLIMBERS.

There are many homes which could be made much more attractive looking by the judicious use of a few good vines. A house which lacks any pretence of beauty in architecture may have much of the stiffness taken from it by planting a vine where it will break the monotony of a straight wall. Verandahs, summer houses, fences, rocks and old stumps of trees covered with vines will so change the appearance of a place that it will hardly be recognized by one who has known it before. There are so many good native climbers that it is not necessary to go to any expense in procuring something which will produce the desired effect. In the following list some of the best of those described are natives. Climbers usually make rapid growth when once established. The best results will be obtained, however, by preparing the ground well beforehand. Usually the soil about buildings is poor, and if such be the case it will well repay any

A SHADY CORNER IN AN OTTAWA GARDEN ON RIDEAU STREET, OTTAWA.

one to remove it where the vines are to be planted and replace it with some of a good loamy character, thoroughly mixing well rotted manure with it. If such preparation is given the results will almost certainly be satisfactory.

Ampelopsis quinquefolia—Virginian Creeper.—This fine climber has several points of merit which commend it to those who desire a hardy, graceful, attractive vine. It is a rapid grower, and being a native is perfectly hardy. Its glossy, green leaves become very brilliant in autumn, when they assume many shades of red. Although it has tendrils by which it clings if there are crevices into which they can be inserted, it will not cling to a wall where there are not such places, and has to be supported in some other way. It is very desirable for training over summer houses, fences, verandahs, and even on walls, where it falls in graceful festoons and becomes very attractive. Unfortunately, it is much subject to thrip, and while there is a remedy in whale oil soap, tobacco water, and kerosene emulsion, they have to be applied very persistently. Where there is a good circulation of air or where the vines are often moved by the wind, the thrip is not so troublesome.

Self-fastening Virginian Creeper.—The advantages of this vine over the ordinary Virginian Creeper are so great, in certain respects, that it should be grown in preference to the latter if a vine is desired for covering a wall. This variety has smaller leaves than the ordinary species, and while those of the latter are quite smooth and shiny, those of the former are downy on both sides. The tendrils of *hirsuta* are short and furnished with large discs, by means of which this vine clings to a brick or stone wall almost as tenaciously as the Japanese Ivy. It is much neater looking than the ordinary form, and needs practically no attention as regards training. The leaves colour about as highly at Ottawa as the common Virginian Creeper. This variety may be found growing wild in the woods in the vicinity of Ottawa.

Ampelopsis Veitchii.—Japanese Ivy.—The Japanese Ivy is not thoroughly satisfactory at Ottawa, as it kills back more or less every year, and sometimes is killed out altogether. It is a beautiful vine and clings so tightly to the wall, on which it is, that it is unsurpassed in this regard. The leaves are of an attractive green colour in summer, and at times are highly coloured in autumn. When grown, a north or west side of a building is the best site. Many make the mistake of putting it on the south side. While this cannot always be avoided, a place where it is not much exposed to the sun is better. It appears to be the thawing and freezing of the vine in early spring which often has such an injurious effect upon it. This injury is not as great on a north or west exposure. For the first year or two this vine should be protected in winter until it gets well established. Something which will not readily absorb the heat

should be chosen for this purpose. Straw is a very good material to use, if held in place by something else.

Vitis riparia—Riverside or Sweet-scented Grape.—The grape vine makes a highly ornamental climber, as it is a rapid grower and very graceful. This native species has the great advantage of being perfectly hardy and of having very highly perfumed blossoms. Some vines bear only male flowers but these bloom very freely. One drawback to the wild grape being used as a climber near the house is that it is subject to the attacks of thrips, which disfigure the leaves very much. In exposed places, however, where there is a good circulation of air, they will not be so troublesome.

Aristolochia Sipho—Dutchman's Pipe.—Although the Dutchman's Pipe is not as hardy as some vines, it is grown with fair success here. Before beginning to make rapid growth, however, it requires two or three years to become established. The leaves are large, heart-shaped and deep green. This vine, though quite attractive, has a heaveir look than some others, and is more in keeping with the massive building than with one of a lighter style. It twines about whatever object comes within reach and does well on a trellis or verandah. The flowers, which are partially hidden by the large leaves, are brown and of peculiar shape, much resembling a Dutchman's pipe. It is a native of the eastern United States, and grows from 20 to 30 feet high.

Celastrus articulatus—Japanese Climbing Bitter-sweet.—This is just as attractive, if not more so, as the native species. The berries are smaller, but more abundant, and there is a greater contrast in colour between the outside and inside of the fruit than there is in *Celastrus scandens*, the colour in this case being yellow and orange. It is a native of Japan, a rapid grower and a very desirable vine.

Celastrus scandens.—Climbing Bitter-sweet, Wax-work.—Next to the Virginian Creepers and Virgin's Bower, this is probably the best native climber that we have. It is a very rapid grower, with pretty bright green leaves, and highly ornamental fruit. It is suitable for training over summer houses and verandahs, and twines about everything it can get hold of. In procuring this vine, one should be certain that he is getting one which produces both male and female flowers, as some vines have only male blossoms, and in such cases no fruit is produced and much of the beauty of the vine is lost, as the fruit is quite attractive and hangs on most of the winter. The berries are of an orange colour until they are cracked open by frost, when the interior, which is scarlet, is revealed.

Clematis Jackmanni.—The large flowered Clematis are well represented by this suberb variety, which is one of the best of them. The flowers are very large and rich, violet purple in colour, with a velvety appearance. It is a very free bloomer and remains in flower for several weeks. Where a strong colour

effect is desired this is a good plant to use. There are now many varieties of large flowering Clematis, and a good range of colour can easily be obtained.

Clematis paniculata—Japanese Clematis—No climber introduced in recent years has proved as satisfactory and as beautiful as this one. It is not as hardy as *C. virginiana*, but it is much finer when in bloom. The flowers are larger than *C. virginiana*, or *C. Vitalba*, and are much whiter. This attractive vine does not bloom until autumn, and is at its best during the month of September, when other kinds have gone to seed, at which time it is a perfect mass of attractive white, sweet-scented flowers. It kills back considerably every winter, but the growth is so rapid in the spring that this is not a great disadvantage, unless one desires to have a large surface covered, when *C. virginiana* is better.

Clematis virginiana— Virgin's Bower.—Next to the Virginian Creepers, this is the most satisfactory native climber to plant, and the most satisfactory where the former are troubled with thrips. It is a very rapid grower, and soon covers anything it is planted near. It clings by tendrils, and should have something to which these can fasten. The leaves are of a lively green colour and of graceful form. About mid-summer the small greenish-white male flowers come into bloom, and these are produced in such abundance that the vine is fairly covered with them. The female flowers are also attractive.

Clematis Vitalba.—Traveller's Joy.—A European Clematis which very much resembles *C. virginiana*. It is a rapid grower and quite hardy. Where it is more convenient to get this species than the native one it may be planted with the certainty that it will give good satisfaction.

Lonicera Periclymenum—English Honeysuckle, Woodbine. Though not quite as hardy as the next species, this honeysuckle will succeed if the vine is laid down and protected in winter. It blooms about the middle of June, and the flowers are bright pink outside and yellow within, and have an agreeable spicy odour, which makes it a desirable vine for planting by or near the house.

Lonicera sempervirens—Scarlet Trumpet Honeysuckle.—A very attractive climbing honeysuckle, blooming almost continuously from the first week of June until late in autumn. The profusion of bright, scarlet, trumpet-shaped flowers produce a fine effect when it is trained against a house or wall. It is a native of the Eastern States, and is sufficiently hardy at Ottawa.

Lycium chinense—Chinese Matrimony Vine.—This is a graceful climbing shrub which is very useful for covering rocks, stumps of trees, or anything else where a tall growing vine is not required. Neither the leaves nor flowers are particularly ornamental, but the graceful habit of the plant commends it, together with the fact that in the autumn the bright scarlet fruit

gives it a very attractive appearance. There is a variety, *macrocarpum*, which is an improvement on the ordinary form, in that the fruit is larger, and hence more conspicuous. The ordinary Matrimony Vine, *L. europaeum*, is a desirable climber also, but it is not as good as *L. chinense*, as the fruit is much smaller.

The Wistarias and Actinidias are also good climbing shrubs where they can be grown successfully. The former have bloomed at Ottawa, but they are not very satisfactory, except in the mildest parts of the province of Ontario.

HEDGES.

A few words in this publication in regard to hedges are desirable as there should be many more hedges planted in Ottawa than there are at present. They make neat and attractive boundaries and are very useful in screening unsightly backgrounds. Some of the best quick growing tall deciduous hedges are the Alder Buckthorn (Rhamnus Frangula) and the Siberian Pea Tree (Caragana arborescens). For a lower hedge the Thunberg's Barberry (Berberis Thunbergii) is the most satisfactory. The best evergreen hedge is the American Arbor-Vitae (Thuya occidentalis). Before choosing a hedge plant, however, a visit should be made to the Experimental Farm where there are upwards of one hundred sample hedges for comparison.

FRUITS FOR THE HOME GARDEN.

There are many gardens in Ottawa where fruit could be successfully grown but where at present not a tree or bush is to be found. Only those who have a plentiful supply of fresh fruit in their own gardens realize what is missed by those who have none. The planting of fruit in every garden is herewith suggested and as a guide to those who may desire to plant large or small fruit, the following varieties are recommended:

Apples—

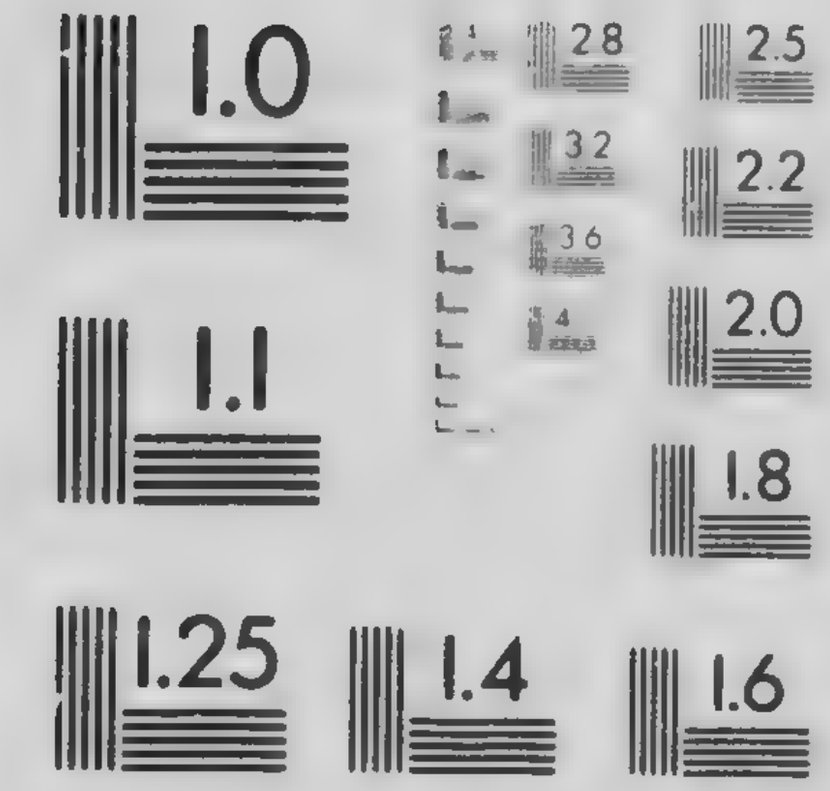
Summer Varieties,—Duchess, or Lowland Raspberry.
Autumn Variety,—Langford Beauty, St. Lawrence, Wealthy
Early Winter,—McIntosh, or Fameuse.
Winter Varieties,—Best Varieties, such as N. Spy, not hardy enough.
See C.E.F. Apple Bulletin for other varieties.
Crab Apples,—Whitney, Martha, Hyslop.

Plums—

Nigra Varieties,—Cheney.
American Varieties,—Omaha, or Stoddard.
European varieties, Raynes or Mount Royal.

MICROCOPY RESOLUTION TEST CHART

ANSI and ISO TEST CHART No. 2



APPLIED IMAGE Inc

Cherries—

Sour Cherries,—Orel 24, Cerise d'Ostheim

There is rarely a full crop of cherries at Ottawa.

Raspberries—

Red Raspberries,—Herbert.

Blackcap Raspberries,—Hilborn, Cumberland

Purple Raspberries,—Columbian.

Blackberries—

Agawam or Snyder.

Currants

Red,—Pomona, or Wilder.

Black,—Boskoop Grant, Victoria.

White,—White Grape, White Cherry.

Gooseberries

American,—Pearl, or Downing.

English (often recommended),—Whitesmith and Industry.

English (recommended by R. B. Whyte),—Trumpeter and Leader.

Strawberries

Early,—Bederwood.

Mid-season,—Senator Dunlap.

Medium Late,—Parson's Beauty, Wm. Belt.

Grapes

White,—Green Mountain, Moore's Diamond.

Red,—Brighton, Delaware.

Black,—Moore's Early, Merrimac.

THE CITY VEGETABLE GARDEN.

Situation of the Garden:—In the city there is little choice in regard to the situation of the garden as one has usually no alternative, but the back of a lot. If large trees surround this lot or are even along one side of it, gardening will be more difficult, and much less satisfactory than where there are none. Trees exhaust the soil of moisture and plant food and their shade often affects the crop adversely. Even where there are trees, however, fair success may be obtained with short season crops such as lettuce, radish, and spinach which can be grown early in the spring or in the autumn when the growth of the trees is not very active.

Preparation of the Soil:—To get the best results the soil should be brought into good tilth. When beginning gardening it is often found that many difficulties have to be overcome before the soil is in really good condition. Old cans, stones, bricks, pieces of wood, broken toys and many other things must be removed or buried so deeply that they will not be troublesome. Then it often happens that the subsoil from the cellar of the

house has been thrown over the yard in order to level the ground. This is sometimes of great depth. This subsoil is usually either a stiff clay or sand. Clay, while it will give more hard work, is usually a much better material to start with than sand. If there are many coal ashes in the yard most of them should be removed altogether or buried in one corner of the yard. A little ashes mixed with the clay will help to make it more friable or more open, but there is little plant food in coal ashes and there should be a minimum of them in good garden soil. A mixture of sand and clay will help to make the soil of a better consistency than is either one of these alone. An application of lime to clay at the rate of about two tons per acre or about 100 pounds to a garden 25 x 40 feet in size, or even half that quantity and thoroughly mixed with the clay, will help in breaking it up, but the most important thing of all is the manure, preferably rotted manure if it can be obtained. Fifty tons per acre is none too heavy a dressing. When spread on the ground before digging in it can be from three to four inches thick without there being too much. This should be well worked through the upper foot of ground whether it be good soil, clay, or sand. If the manure is strawy it should be well dug in so that the straw will not be pulled out when the soil is raked. With a heavy annual application of manure even the poorest soils can be made to give good returns providing there is sufficient moisture in the soil which in the city can be applied artificially. Where no water is available very strawy manure applied to light soils is apt to make them loose and they dry out easily and seed does not germinate well, hence well rotted manure is much better for such soils if it is available. The rolling of light soils where strawy manure has been used will be found useful in bringing the moisture to the surface and hastening the rotting of the straw. The great aim should be to eventually get the soil into such a condition that it will neither bake nor become hard in a dry time nor dry out readily and both of these conditions will be brought about by the liberal use of manure which adds plant food in an easily available form and helps to form humus which is so essential to a good physical condition of the soil. Clay soils should not be dug when they are very wet as they will bake badly, but by waiting until they are fairly dry they can be worked much better.

A spade, a hoe, a garden rake and a digging fork are the four chief tools needed in gardening. Narrow hoes and rakes are best for small gardens, or well made children's tools but with long handles. In stiff clays it may be found necessary to use the hoe after the soil has been dug in order to break it down, so that the rake may be used advantageously. The rake is now used to level the soil and to pulverise it still more. The surface soil should be made as level, smooth, and as fine as possible.

If the soil for two or three inches down is in good condition a quick germination of the seed will usually be assured.

Planning the Garden: It is desirable to plan the garden some time in advance in order to be able to lay it out to the best advantage. It should be planned to provide for a good assortment of vegetables, for a regular and continuous supply, and for the greatest quantity from the land available. The appearance of the garden should also receive some consideration. Certain kinds of vegetables only take a comparatively short time in which to mature; some kinds succeed best in the cooler parts of the season, either in the spring or late summer; others need the hottest weather to reach their greatest perfection. While others require both the cool weather of spring and the warm weather of summer to complete their growth. The seed of some kinds may be sown as soon as the ground is dry enough in the spring, while the seed of others should not be sown until danger of frost is past; and in order to get the best results the seed of others must be started in a hot-bed, greenhouse, or ordinary house and the plants well advanced before they are set outside. Warm soil is just as essential to the success of some vegetables as freedom from frost and even if protected from frost they will not do so well unless the ground is warm. Some vegetables, such, for instance as celery, require considerably more moisture than others.

Seeds to be sown:

(Early in spring), beets, carrots, lettuce, onions, parsnips, peas, radishes, kohlrabi, garden cress, salsify, spinach, parsley, and leeks.

Seed sown:

(In hot-beds, but plants will stand some frost), cabbage, cauliflower, celery.

Seed to be sown:

(After danger of frost is over, unless protected), beans, corn, cucumbers, melons, potatoes and squash. Seed of late cabbage is not sown until May but the plants will endure frost and seeds of Swede turnips should be sown late, though turnips will stand frost.

Seed sown:

(In hot-beds, but plants will not stand frost), melons, egg-plants, peppers.

Some plants require a much longer season than others, hence in planning the garden this should be taken into consideration.

As previously stated, a small vegetable garden should be arranged with a view to having a good assortment and a continuous supply. It should be planned so that vegetables having a long growing season, such as beets, carrots, parsnips and onions, would be grown at one side or end of the garden so that there will

be no rows scattered here and there to make the garden look patchy during late summer. A small bed of asparagus and some rhubarb roots are desirable if the garden is to be permanent and these should be put about a foot and a half from one of the boundaries so that they will not interfere with the vegetables planted every year.

Vegetables can be planted much closer in a garden than under field culture where most of the work is done with horses, hence a foot or fifteen inches is far enough apart for the rows of a good many kinds.

Following is a suggested arrangement of a small garden about 33 x 30 feet, but many other plans could be made. No provision is made for paths but if a narrow path is found necessary it can be put in where it seems most convenient. The seeds of the kinds to be sown earliest are sown in one part of the garden and the latter sowings and plantings in the other so that the ground can be newly worked if necessary for the later sowings. For best results, the surface soil should be kept loose and free of weeds, by means of the rake and hoe, during the summer months.

LIST OF BEST VEGETABLES.

Asparagus:—Palmetto is proving a better variety than Conover Colossal for general planting, as it is not so subject to the disease known as Asparagus Rust. Argenteuil is also a good variety.

Beans:—Round Pod Kidney Wax and Wardwell Kidney Wax are two of the best yellow-podded or wax bush beans, and are both early. Stringless Green Pod, Early Red Valentine and Early Refugee are three good, green-podded varieties. Refugee or Thousand to One is one of the best later sorts. Among Lima beans, the dwarf or bush forms are the most satisfactory.

Beets:—Meteor, Early Model, Crosby Egyptian and Eclipse are some of the best.

Borecole or Kale:—Dwarf Green Curled Scotch.

Broccoli:—White Cape.

Brussels Sprouts:—Improved Dwarf. The dwarf varieties have been found more satisfactory than the tall-growing ones.

Cabbage:—Early Jersey Wakefield, Copenhagen Market (early), Succession (medium), Danish Ballhead and Drumhead Savoy (late), Red Dutch (red) is a good list. Houser has been found freer from disease than most. For extra early use, Paris Market is desirable, being nearly a week earlier than Early Jersey Wakefield.

Cauliflower:—Early Dwarf Erfurt and Early Snowball.

Carrots:—Chantenay is one of the best, but if a good extra early sort is required, the Early Scarlet Horn can be planted with advantage. It is a small variety.

Celery:—Golden Self-Blanching (Paris Golden Yellow) early French Success, Noll Magnificent, Perfection Heartwell, Triumph, Winter Queen are all good late varieties. London Red is a good red one. White Plume is desirable for the prairies

Corn: Malakoff, Peep O'Day (extra early), Early Fordhook, Early Cory (early), Crosby Early, Golden Bantam, Metropolitan (second early) Perry Hybrid, Early Evergreen and Black Mexican (medium) Stowell Evergreen, Country Gentleman (late). In planting the Country Gentleman should not be omitted, as it lengthens the season very considerably and is of fine quality. Golden Bantam is the best second early for home use. It is of excellent quality.

Cucumbers:—Peerless White Spine or White Spine, Davis Perfect, Cool and Crisp, and Giant Pera are some of the most satisfactory. Boston Pickling and Chicago Pickling are good pickling sorts.

Egg Plant:—New York Improved and Long Double Purple succeed best.

Lettuce:—Grand Rapids, Blackseeded Simpson (early curled) Iceberg, New York, Giant Crystal Head, Crisp as Ice, and Improved Hanson (curled cabbage), Improved Salamander (uncurled cabbage). Grand Rapids is the best variety for forcing. Iceberg remains headed longest in summer, and should always be planted. Trianon and Paris are two of the best Cos varieties.

Melons, Musk:—Long Island Beauty and Hackensack are two of the earliest and best of the Nutmeg type. Montreal is later, but of larger size and finer flavour. Emerald Gem and Paul Rose are two of the best yellow fleshed melons.

Melons, Water:—Cole Early, Salzer Earliest, Ice Cream, Phinney Early are some of the most reliable.

Onions:—Yellow Globe Danvers and Large Red Wethersfield are two of the best and most reliable. Australian Brown is also good. Prize Taker is a good variety for transplanting.

Parsley:—Double Curled is as good as any.

Peppers:—Cayenne, Chili, Cardinal. The Early Neapolitan is one of the earliest of the large peppers.

Peas:—Gregory Surprise (extra early), Thos. Laxton, Gradus, American Wonder, Nott Excelsior, Sutton Early Giant (early), Sutton Excelsior, Premium Gem (second early), McLean Advancer, Heroine and Stratagem (medium to late). The foregoing varieties, not being tall growers, may be grown without supports. Quite Content, Telephone and Champion of England are three of the best tall-growing sorts.

Potatoes:—Early: Rochester Rose, Early Ohio (pink), Irish Cobbler, Eureka Extra Early, Early Petoskey, New Early Standard (white), Bovee, (pink and white). Main crop: Carman No. 1, Gold Coin, and Green Mountain (white).

Radishes:—Early: Scarlet White-tipped Turnip, Rosy Gem, French Breakfast, Red Rocket (red), Icicle (white) Late: White Strasburg, Long White Vienna. Winter: Long Black Spanish, Chinest Rose-coloured, New White Chinese or Celestial.

Rhubarb:—Linnæus, Victoria.

Salsify:—Long White, Sandwich Islands.

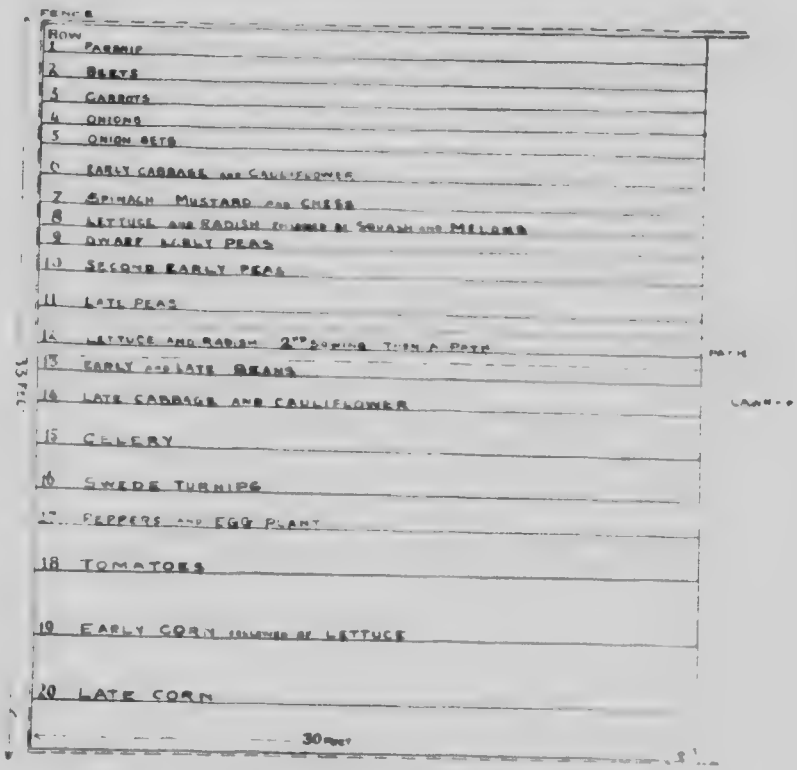
Spinach:—Victoria, Thickleaved.

Squash:—White Bush Scalloped, Long White Bush, Summer Crook Neck. Late: Delicious, Hubbard.

Tomatoes:—Early: Sparks Earliana, Chalks Early Jewel, Bonny Best, Dominion Day (scarlet). Medium: Matchless, Trophy (scarlet), Livingston Globe, Plentiful (purplish-pink).

Turnips:— Early: Extra Early Milan, Red Top Strap Leaf. Early turnips are usually bitter to the taste and not desirable.

Swedes:—Champion Purple Top, Skirving Improved.



PLAN OF VEGETABLE GARDEN FOR A SMALL CITY LOT.

PLAN OF A HOME VEGETABLE GARDEN (33 x 30 Feet).

Row	Kind of Vegetable.	Seed required for 30-foot row.	Distance apart of rows	Depth to sow seed.	Distance to thin plants.	Time required to develop for use. Based on results at Ottawa.	Yield per 30-foot row
	Sown as finished early.						
1	Parsnips	1 pkt	18 ins. from lettuce	½ inch	2 ins. apart	105 to 112 days	60 to 80 lb.
	Beets	1 oz	12 ins. from Row 1	½ inch	2 ins. apart or thinned as ready	55 to 70 days	50 to 60 lb.
	Carrots	1 pkt	12 ins. from Row 2	½ inch	1½ ins. apart or thinned as ready	64 to 76 days	65 to 75 lb.
	Onions	¼ oz	12 ins. from Row 3	½ inch	Thin	95 to 120 days	40 to 60 lb.
	Onion Sets	1 qt	12 ins. from Row 4	[illegible]	Plant 2 ins. apart	50 days	40 to 60 lb.
	Early, Cauliflower and Cabbage Plants	2 plants	15 ins. from Row 5	Root [illegible]	Plant 18 ins. apart	100 to 120 days	5 to 5½ lb. per plant
	Sweet Corn, Marrow and Cucumber Cross	1 pkt	24 ins. from Row 6	[illegible]	4 to 6 ins. apart	60 days	Weight varies 2 to 5 lb.
	Early and Late Radishes, Spinach, Lettuce, Mustard, Cress	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Weight varies [illegible]
	Early Cabbage	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Early Potatoes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Early Peas	[illegible] oz	18 ins. from Row [illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Early Potatoes	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Early Cauliflower, Early Cabbage, Early Lettuce, Early Beets, Early Carrots, Early Onions, Early Parsnips, Early Peas, Early Potatoes, Early Sweet Corn, Early Cucumbers, Early Marrows, Early Radishes, Early Spinach, Early Mustard, Early Cress	[illegible]	18 ins. from Row 11	[illegible]	[illegible]	[illegible]	[illegible]
	Early Tomatoes	[illegible] oz	18 ins. from Row 12	[illegible]	[illegible]	[illegible]	[illegible]
	Early Cucumbers, Early Marrows, Early Radishes, Early Spinach, Early Mustard, Early Cress	10 [illegible]	18 ins. from Row 13	Root [illegible]	18 ins. apart	10 to 13 days	[illegible]
	Early Sweet Corn	1 pkt	24 ins. from Row 14	[illegible]	Plant 5 ins. apart	5 weeks	12 to 19 ears per plant
	Early Cucumbers, Early Marrows, Early Radishes, Early Spinach, Early Mustard, Early Cress	1 pkt	24 ins. from Row 15	[illegible]	Thin to [illegible] ins. apart	60 to 90 days	60 to 80 lbs.

Row	Kind of Vegetable.	Seed required for 30-foot row	Distance apart of rows.	Depth to sow seed	Distance to thin plants.	Time required to develop for use. Based on results at Ottawa	Yield per 30-foot row
17.	Peppers and Egg Plant or third sowing of lettuce and third sowing of lettuce and radish or more late cauliflower, or early sowing of parsley	1 pkt. of each	18 ins. from Row 16	Roots well covered	Plants 15 ins. apart	Peppers 13[illegible] to 1.8 day Egg Plants 150 to 162 days	Yield varies [illegible]
18.	Tomatoes, trained to [illegible] stems and [illegible] to 5 foot stake or wires	1 pkt or 15 plants	24 ins. from Row 17	Roots well covered	Plants 2 feet apart	108 to 1.9 da[illegible] depending on when started, and season	100 to 150 lb[illegible]
19.	Early Corn followed by late sowing of lettuce and radish	1 pkt.	36 ins from Row 18	2 ins.	Hills 3 feet [illegible]	66 to 94 days	40 [illegible] 50 ear
20.	Later corn [illegible] boundary.	1 pkt	36 ins [illegible] Row 19	[illegible]	[illegible] 3 feet apart [illegible]	[illegible] 11[illegible] days	

Estimated cost of seeds and plants $[illegible] [illegible] $[illegible] [illegible] these, Cucumbers would be grown [illegible] Melons, Cucumbers and S[illegible]

A KITCHEN GARDEN.

(From "The Spectator".)

I have always thought a kitchen garden a more pleasant sight that the finest orangery, or an artificial greenhouse. I love to see everything in its perfection, and am more pleased to survey my rows of colworts and cabbages, with a thousand nameless potherbs, springing up in their full fragrancy and verdure, than to see the tender plants of foreign countries kept alive by artificial heats, or withering in an air and soil that are not adapted to them . . . . .

THE GREENHOUSE.

(*William Cowper.*)

Who loves a garden, loves a green-house too.
Unconscious of a less propitious clime
There blooms exotic beauty, warm and snug,
While the winds whistle and the snows descend.
The spicy myrtle with unwithering leaf
Shines there and flourishes. The golden boast
Of Portugal and western India there,
The ruddier orange and the paler lime,
Peep through their polished foliage at the storm,
And seem to smile at what they need not fear.
The amomum there with intermingling flowers
And cherries hangs her twigs. Geranium boasts
Her crimson honours, and the spangled beau
Ficoides, glitters bright the winter long.
All plants of every leaf that can endure
The winter's frown, if screen'd from his shrewd bite,
Live there and prosper

HOUSE PLANTS.

A little more thought, and therefore common sense, should be used by those who desire to brighten their rooms during the dull winter months. Many people buy, and intend to care for, plants for this object. Among these, many have no actual love for them but buy them because others do, and think that once they have them their duty in the matter is over. But it has only just commenced.

To grow house plants successfully you must bear in mind that they are alive and have to be kept so and not to be classed with bric-a-brac, etc. Their wants must be studied, and from experience it is found that the best success is gained by giving them personal attention. Do not trust them to the care of those who have no interest in them and will only look after them in a mechanical way, the same as they do with the furniture in the house. At best, the growing of plants in the house is quite a

study. Temperature is so uncertain, and moist atmosphere, which the plants need, is not to be got, hence it is quite a study to grow plants successfully under such conditions. It is easier to grow plants in glass structures than in the house.

PLANTS FOR THE TABLE.

Light is one of the great factors in success, and that is where the house fails us. One is often asked whether it is right or wrong to put certain plants in the window because of the strong light. Any plant you have or may buy will be benefitted by all the light that can be got through our too heavily curtained windows, and more especially flowering plants which can be kept in flower only with good light.

Never keep flowering plants on tables in the centre of the room or on the piano or in corners on stands where they look so pretty, but give them the lightest place in the room. If plants are wanted for the piano, the table, the stairs, or to fill some corner use suitable ones, such as ferns, palms, Araucarias, Aspidistras, etc., although these would do better with more light, but they will do fairly well in these positions.

For the dining table there is no more suitable or useful ornament than the low fern pan, filled with several species of low-growing ferns. They are pretty and durable, but even with these do not keep them always on the table, but when not in use move them to some suitable place where they will get the stimulating effect of a little light. These pans are now in common use as they take the place of vases of cut flowers which in winter are apt to be rather costly. To give immediate effect, ferns must be planted thick, and as the pan is soon filled with roots, they require thorough watering. When doing this be sure you have given them enough to go through the whole pan. The best way is to stand them in a pan of water until all the soil is wet.

It has always seemed to me that plants might be compared somewhat to human beings in that they want a change of surroundings. Therefore, it is beneficial to move them round to different places, always turning a different side to the light. By this they get a change in the current of air passing round them and get the light applied to a side that was hitherto in the dark.

PLANTS FOR WARM AND COOL POSITIONS.

As to temperature, it is hardly possible in our rooms to regulate the heat to suit the different needs of different plants and, where heat is concerned, we are selfish enough, and rightly so, and study our own comfort in winter rather than the temperature requirements of the plants. To overcome this we must use judgment in placing our plants—those that need a cool temperature, give them the coolest place, and vice versa. Most flowering plants will need the coolest place; foliage plants, the

warmest, the exception being Araucarias or Norfolk Island Pine, which will do best cool. But if possible avoid placing any plant near the registers, as the dry heat from these is most injurious to plants. When you visit greenhouses you think and say how very warm they are, yet when there is no sun they are not, as a rule, kept as warm as your rooms. The average temperature of our greenhouse at night is 55° F., your room is 65° F.; then in the house your temperature is kept as warm at night as in the daytime. In greenhouses we make a difference of 10 to 15 degrees. As the plant at night is without light and, to use the word, sleeping, an excessive heat only forces growth which without the light means a spindly, weakly, drawn-up appearance. This is mentioned that you may see that with good management one can to a certain extent counteract these difficulties.

One caution is given—plants, like ourselves, are greatly benefitted by fresh air. In opening windows to admit air don't forget that a plant to get frozen or chilled need not stand close to the opening, but may get touched at quite a distance from the door or window if in direct line of the inrushing current of air. Plants do not like cold draughts, so be careful in placing plants near door-ways or in halls or stairways when the opening of outside doors lets in frosty air.

CAREFUL WATERING IMPORTANT.

The watering of plants is a most important item in plant growing. It seems difficult to get into some people's minds the fact that plants cannot be watered by rule. Half the people if asked the question: When do you water your plants? will tell you, "a little every morning." That means whether dry or not. That is very poor plant growing. It means that the top of the soil is wet and sour and the bottom dry. Plants must be watered whey they are dry. That will depend a good deal on the health of the plant and the temperature of the room. A plant in good health will take up much more water than a sickly plant; in fact, when a plant is not healthy it is no good giving it a lot of water as most likely the roots are in a bad way, and as they will not use up the water the soil will become soggy and make your plant worse.

The temperature of the room will have a great deal to do with the amount of watering necessary. A plant in 70 degrees will dry out quicker than a plant in 55, and of course must have water. Before watering, look at your plant and feel the soil. If it feels dry and does not stick to your finger you will know it needs water, and water thoroughly, making sure it goes through the whole pot. Never let a plant wilt for want of water. They are never the same again if it is allowed to occur often. Never let your plants stand in water in the jardiniere; that soon kills. An exception is the herbaceous Spiraea. It does not hurt this

plant to stand in a saucer of water. To avoid this, always look at your plants every morning. Don't say they will go until tomorrow, but look and make sure.

Foliage plants are the better for sponging once in two weeks at least. It takes off the dust and cleans off the young scales—the palm enemy—and if it is faithfully done you will not have any scaly palms.

If you find the water stays in your pots look at the drainage at the bottom; get a stick and clean out the hole. This is often stopped by the worms churning up the soil and plugging up the hole. If this is done no earth worm will hurt your plant. We are often told by ladies that their plant is not doing well, "there is a worm in the pot."

In conclusion the following advice is given. In the coolest room put your Geraniums, Azaleas and bulbous plants, such as Hyacinths, Narcissi, etc., as these keep so much longer when kept cool, also the Primroses, Cyclamens, Cherries, Spiraeas, Lilacs and Rhododendrons. In the warmer positions, Ferns, Palms, Begonias, Poinsettias, Dracaenas and Lilies, Heliotrope and Fuchsias.

"The love of flowers is a sentiment common alike to the great and to the little; to the old and to the young; to the learned and to the ignorant; the illustrious and the obscure. While the simplest child may take delight in them they may also prove a recreation to the most profound philosopher."—*Flora Domestica.*

"The gardener's work is one of worth,
He's partner with the sky and earth:
He's partner with the sun and rain,
And no man loses by his gain."

The information contained in this bulletin is based on experiments conducted at the Central Experimental Farm and in the gardens of successful horticulturists in the City of Ottawa. Gratitude is expressed to those who have supplied photos for the illustrations.

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